Aviation Rulemaking Advisory Committee

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of establishment of FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes.

SUMMARY: Notice is given of the establishment of a FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes for the FAA Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC on noise certification issues.

FOR FURTHER INFORMATION CONTACT: Mr. Paul R. Dykeman, Assistant Executive Director for Noise Certification, Deputy Director, Office of Environment and Energy (AEE-2), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-3577; FAX: (202) 267-5594.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993). One area of the ARAC deals with noise certification issues. These issues involve the harmonization of part 36 of the Federal Aviation Regulations (14 CFR part 36) with Joint Aviation Requirements (JAR) part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will forward recommendations to the ARAC, which will determine whether to forward them to the FAA.

Specifically, the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is charged with reviewing the applicable provisions of subparts A and F, and appendices F and G of the 14 CFR part 36 and harmonizing them with the corresponding applicable provisions of JAR 36.

ARAC should consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. ARAC should also consider recommending a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and FAR 36.

If the ARAC determines that Notice of Proposed Rulemaking (NPRM), an Advisory Circular (AC), or both would be appropriate, those documents are to be submitted, in the format prescribed, to the FAA. The Working Group should make recommendations to the ARAC in the following manner.

Reports

(a) Recommend a work plan for completion of the task and subtasks, including the rationale supporting the plan, for consideration at the meeting of the ARAC to consider noise certification issues held following publication of this notice;

(b) Give a detailed conceptual presentation on the proposed recommendation to the ARAC before proceeding with the work stated in item (c) below;

(c) If considered appropriate, develop NPRM(s) proposing the revised rules for aircraft noise certification, a supporting economic and other required analyses, advisory and guidance material, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition; and

(d) Give a status report on the task at each meeting of the ARAC held to consider noise certification issues.

The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will be comprised of experts from those organizations having an interest in the tasks assigned. A Working Group member need not necessarily be a representative of one of the organizations of the ARAC. Individuals who have expertise in the subject matter and wish to become a member of the Working Group should write the person listed under the caption, **FOR FURTHER INFORMATION CONTACT**, expressing that desire, describing their interest in the task, and the expertise they would bring to the working group. The request will be reviewed by the ARAC Assistant Chair for Noise Certification and the Chair of the Working Group, and the individual will be advised if the request can be granted.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary and in the public interest, in connection with the performance of duties of the FAA. Meetings of the ARAC to consider noise certification issues will be open to the public, except as authorized by section 10(d) of the Federal Advisory Committee Act. Meetings of the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of Working Group meetings will be made.

Issued in Washington, DC, on April 25, 1994.

Paul R. Dykeman,

Assistant Executive Director for Noise-Certification, Aviation Rulemaking Advisory Committee.

[FR Doc. 94-10574 Filed 5-2-94; 8:45 am]

BILLING CODE 4910-13-M

NOISE_TASK_PROPELLERW

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 36

[Docket No. ; Notice No. 96-]

RIN 2120-

Noise Certification Standards for Propeller-Driven Small Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of Proposed Rulemaking (NPRM).

SUMMARY: The FAA proposes changes to the noise certification standards for propeller-driven small airplanes. These proposals are based on the joint effort of the Federal Aviation Administration (FAA), the European Joint Aviation Authorities (JAA), and Aviation Rulemaking Advisory Committee (ARAC) to harmonize the U.S. noise certification regulations and the European Joint Aviation Requirements (JAR) for propeller-driven small airplanes. The proposed changes would provide nearly uniform noise certification standards for airplanes certificated in the United States and in the JAA countries. The harmonization of the noise certification

standards would simplify airworthiness approvals for import and export purposes.

DATE: Comments must be received on or before [Insert date 120 days after date of publication in the Federal Register].

ADDRESS: Submit comments on this notice in triplicate to: Federal Aviation Administration, Office of the Chief Counsel, Attention: Rules Docket (AGC-10), Room 915G, Docket No. , 800 Independence Avenue, SW, Washington, DC 20591. Comments may also be submitted to the Rules Docket by using the following Internet address: nprmcmts@faa.dot.gov. Comments must be marked Docket No. . Comments may be examined in the Rules Docket in Room 915G on weekdays between 8:30 a.m. and 5:00 p.m., except on Federal holidays.

FOR FURTHER INFORMATION CONTACT: Mehmet Marsan, Office of Environment and Energy (AEE), Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267-7703.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in this rulemaking by submitting written comments, data, views, or arguments. Comments on the possible environmental, economic,

and federalism or energy related impact of the adoption of this proposal are welcomed. Comments concerning the proposed implementation and effective date of the rule are also specifically requested.

Comments should carry the regulatory docket or notice number and should be submitted in triplicate to the Rules Docket address specified above. All comments received and a report summarizing any substantive public contact with FAA personnel on this rulemaking will be filed in the docket. The docket is available for public inspection both before and after the closing date for receiving comments.

Before taking any final action on this proposal, the Administrator will consider the comments made on or before the closing date for comments, and the proposal may be changed in light of the comments received.

The FAA will acknowledge receipt of comments if commenters include a self-addressed, stamped postcard with the comments. The postcards should be marked "Comments to Docket No. _____." When the comments are received by the FAA, the postcards will be dated, time stamped, and returned to the commenters.

Availability of the NPRM

An electronic copy of this document may be downloaded from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703-321-3339) or the Federal Register's electronic bulletin board service (telephone: 202-512-1661), using a modem and suitable communications software.

Internet users may reach the FAA's web page at http://www.faa.gov or the Federal Register's webpage at http://www.access.gpo.gov/su_docs for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by mail by submitting a request to the Federal Aviation Administration, Office of Rulemaking, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267-9677. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's should request from the FAA's Office of Rulemaking a copy of Advisory Circular No. 11-2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

Background

Current Regulations

Under 49 U.S.C. 44715 the Administrator of the Federal Aviation Administration is directed to prescribe "standards to measure aircraft noise and sonic boom;...and regulations to control and abate aircraft noise and sonic boom." Part 36 of Title 14 of the Code of Federal Regulations contains the FAA's noise standards and regulations that apply to the issuance of type certificates for all types of aircraft. The standards and requirements that apply to propeller-driven small airplanes and propeller-driven, commuter category airplanes are found in § 36.501 and Appendix G of Part 36. Appendix G addresses Takeoff Noise Requirements for Propeller-Driven Small Airplane and Propeller-Driven, Commuter Category Airplane Certification Tests on or after December 22, 1988. This appendix was added to part 36 on November 22, 1988 (53 FR 47394) to require actual takeoff noise tests instead of the level flyover test that was formerly required under Appendix F, for airplanes for which certification tests were completed before December 22, 1988.

Appendix G specifies the test conditions, procedures, and noise levels necessary to demonstrate compliance with

certification requirements for propeller driven small airplanes and propeller-driven, commuter category airplanes.

Government and Industry Cooperation

In June 1990 there was a meeting of the Joint Aviation Authorities (JAA) Council, which consists of JAA members from European countries, and the FAA. The FAA Administrator committed FAA to support the harmonization of the FAA regulations with the Joint Aviation Regulations (JAR). The Joint Aviation Regulations are being developed for use by the European authorities who are member countries of the JAA.

On January 22, 1991, the FAA announced the establishment of the Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190). The FAA announced the renewal of ARAC on February 19, 1993 (58 FR 9230) and on March 1, 1995 (60 FR 11165). One area that ARAC deals with is noise certification issues. These issues involve the harmonization of 14 CFR part 36 with JAR part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. On May 3, 1994, the ARAC established the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes (59 FR 22885). The Working Group task is

reviewing the applicable provisions of subparts A and F, and appendices F and G of 14 CFR part 36, and harmonizing them with the corresponding applicable provisions of JAR 36. The Working Group was asked to consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. The Working Group was also asked to recommend a process whereby subsequent ICAO Annex 16 changes could be properly incorporated into JAR 36 and 14 CFR part 36.

The Working Group reviewed 16 items related to noise limits and measurement procedures in the regulations. For 6 of these items the Working Group recommended that 14 CFR part 36 be amended to harmonize the regulations with JAR 36. For 4 of these items the Working Group recommended that JAR 36 be amended to harmonize those regulations with 14 CFR part 36. For 6 items, the Working Group found that no harmonization is necessary. The Working Group also recommended changes to harmonize FAA and JAA interpretive and advisory material relating to noise limits for propeller-driven small

airplanes. This NPRM is based on the 6 recommendations that address changes to 14 CFR part 36.

Discussion of Proposals

The proposed changes to appendix G would affect the provisions that establish noise measurement procedures (sec. G36.107), corrections to test results (sec. G36.201) and specific aircraft noise limits that are tied to aircraft weight (sec. G36.301).

Section G36.107 Noise Measurement Procedures.

Currently section G36.107 prescribes specific procedures for the placement of microphones, system calibration and consideration of ambient noise. The proposed changes would affect the microphone requirements of paragraph (a). Currently microphones are required to be oriented in a known direction so that the maximum sound received arrives as nearly as possible in the direction for which the microphones are calibrated and the microphone sensing elements must be placed four feet (1.2 m) above ground level.

The proposed change to section G36.107(a) would require the microphone to be a pressure type microphone with a

protective grid that is 12.7 mm in diameter. The microphone would have to be mounted in an inverted position so that the diaphragm is 7 mm above and parallel to a white-painted metal circular plate. The plate would have to be 40 cm in diameter and at least 2.5 mm thick. The plate would have to be placed horizontally and flush with the surrounding ground surface with no cavities below the plate. The microphone would have to be located three-quarters of the distance from the center to the edge of the plate along a radius normal to the line of flight of the test airplane.

The proposed change, which would make the U.S. regulations consistent with the JAR, is supported by numerous studies, technical papers, and discussions with interested groups. The technical facts indicate that an inverted microphone that measures reflected noise from a metal plate at ground level produces a more consistent and reliable database. The reason is that a microphone that is 4 feet above the ground is much more likely to be affected by variable ground reflections that can interact with the noise produced by the aircraft being measured. The metal plate substantially eliminates these variations.

However, studies also show that measurements using the inverted microphone, metal plate technique produce consistently higher noise levels than those produced under the current procedure, with the difference being about 3 dB(A). Therefore, to maintain the present level of noise acceptability a corresponding change to section G36.301(b) is necessary as is discussed below.

Section G36.201 Corrections to Test Results. Current section G36.201 prescribes corrections to be made to test results to account for the effects of differences between the conditions referenced in the prescribed procedures and existing conditions during an actual test.

Current section G36.201(b) requires that atmospheric absorption correction is required for noise data obtained when the test conditions are outside those specified in appendix G, figure G1. Noise data outside the prescribed range is required to be corrected to 77 degrees F and 70 percent relative humidity by an FAA approved method. This proposal would change the 77 degrees F reference temperature to 59 degrees F which would be consistent with the ambient temperature requirement in current section G36.111(b)(2) that is used for performance calculations. By making the

reference temperatures consistent for absorption and performance, this proposal would eliminate delays and confusion that have been caused by the inconsistency in the current rule.

Current section G36.201(c) requires that helical tip Mach number and power corrections must be made if the propeller is a variable pitch type or if the propeller is a fixed pitch type whenever the test power is not within five percent of the reference power. This proposal would provide an additional exception by stating that a correction is not necessary if the helical tip Mach number meets one of the following:

1. The number is at or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.

2. The number is above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.

3. The number is above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach

number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

These proposed additional exceptions are based on an analysis of noise data from nine U.S. manufactured aircraft. This analysis indicated that the proposed values are well within the Type 1 sound level meter tolerances as defined in IEC Publication 651, which is incorporated by reference in part 36. Adding this exemption would simplify some tests without degrading the results.

Current section G36.201(d)(1) requires that the measured sound levels must be corrected from the test day meteorological conditions by adding an increment equal to the result gained from the following equation:

$$\text{Delta (M)} = (\alpha - 0.7)\ H_T/1000.$$

In this equation H_T is the height in feet of the test aircraft when directly over the noise measurement point and α is the rate of absorption for the test day conditions at 500 Hz as referenced in SAE ARP 866A which is incorporated by reference in part 36.

The equation in section G36.201(d)(1) is incorrect. Therefore, the FAA proposes to change the equation to read as follows:

$$\text{Delta (M)} = (H_T \alpha - 0.7\ H_R)/1000.$$

In this equation H_T is the height in feet under test conditions, H_R is the height in feet under reference conditions when the aircraft is directly over the noise measurement point and α is the same as in the current rule, that is, the rate of absorption for the test day conditions at 500 Hz as specified in SAE ARP 866A.

The proposed equation would bring appendix G absorption calculations in line with the rest of part 36 absorption calculations.

Current section G36.201(d)(4) requires that the measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to:

$$\text{Delta (3)} = 17 \log (P_R / P_T)$$

where P_T and P_R are the test and reference engine powers respectively.

The FAA proposes that the algebraic correction for engine power be changed to:

Delta (3) = K_3 log (P_R /P_T)

where P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. Under this proposal, the value of K_3 would be determined from approved data from the test airplane. In the absence of flight test data and at the discretion of the Administrator a value of K_3 = 17 could still be used as under the current rule.

The only technical difference between the current formula and the proposed formula is the power correction constant. The proposed formula is consistent with the JAR. The current regulation requires the use of 17 for this constant. The K_3 = 17 value is an average value that was derived from FAA tests on seven aircraft where the variation was from 1.5 to 39.3. Although the use of an average value simplifies the test plan, it could penalize an applicant who can prove lower values of K_3 by test data. Therefore, the FAA proposes a formula that allows the applicant to use a lower value for K_3 when it has test data to support that value or to continue to use a value of 17 with the Administrator's permission when test data is not available.

Section G36.301 Aircraft Noise Limits. Current section G36.301(b) states that the noise level must not exceed 73 dB(A) up to and including aircraft weights of 1,320 pounds (600 kg.) and that for weights greater than 1,320 pounds the limit increases at the rate of 1 dB /165 pounds up to 85 dB(A) at 3,300 pounds after which it is constant at 85 dB(A) up to and including 19,000 pounds.

As previously discussed, considerations of microphone location, configuration, and resulting noise limits are interrelated. Since the proposed changes to the noise measurement procedures of section G36.107(a) would result in increases in the measured noise levels of about 3 dB(A), the FAA proposes to increase the limits in section 36.301(b) from 73 dB(A) to 76 dB(A) and from 85 dB(A) to 88 dB(A). This change is to account for the microphone location and configuration requirements. It is not expected to result in any increase or decrease in the noise exposure requirements of the current rule.

In addition to the dB(A) changes discussed, the FAA proposes to change the interpolation requirement of section G36.301(b). For weights greater than 1,320 pounds, the allowable dB(A) would increase "with the logarithm of

airplane weight at the rate of 9.83 dB(A) per doubling of weight until the limit of 88 dB(A) is reached ...," rather than at the rate of 1 dB/165 pounds up to 85 dB(A) at 3,300 pounds, as under the current rule. This change would harmonize interpolation under the FAA regulation with the comparable JAA regulation without substantive change.

Regulatory Evaluation Summary

Costs

Benefits

International Trade Impact

Initial Regulatory Flexibility Determination

Federalism Implications

The proposed regulations do not have substantial direct effects on the states, on the relationship between national government and the states, or on the distribution of power and responsibilities among various levels of government. Thus, in accordance with Executive Order 12612, it is determined that such a regulation does not have federalism implications warranting the preparation of a Federalism Assessment.

Paperwork Reduction Act

The reporting and recordkeeping requirements associated with this proposed rule have previously been approved by the Office of Management and Budget under the provisions of the Paperwork Reduction Act of 1980 (Pub. L. 96-511) and have been assigned OMB Control Number 2120-XXXX.

Conclusion

For the reasons set forth under the heading "Regulatory Analysis," the FAA has determined that this proposed regulation: (1) is **[NOT?]** a significant rule under Executive Order 12866; and (2) is **[NOT?]** a significant rule under Department of Transportation Regulatory Policies and Procedures (44 FR 11034; February 26, 1979). Also, for the reasons stated under the headings "Trade Impact Statement" and "Regulatory Flexibility Determination," the FAA certifies that the proposed rule would **[NOT?]** have a significant economic impact on a substantial number of small entities. A copy of the full regulatory evaluation is filed in the docket and may also be obtained by contacting the person listed **"FOR FURTHER INFORMATION CONTACT."**

List of Subjects

14 CFR Part 36

Agriculture, Aircraft, Noise Control.

The Proposed Amendments

The Federal Aviation Administration proposes to amend 14 CFR part 36, as follows:

PART 36 - NOISE STANDARDS: AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATION

1. The authority citation for part 36 continues to read as follows:

AUTHORITY: 42 U.S.C. 4321 et seq.; 49 U.S.C. 106(g), 40113, 44701-44702, 44704, 44715; sec. 305, Pub. L. 96-193, 94 Stat. 50, 57; E.O. 11514, 35 FR 4247, 3 CFR, 1966-1970 Comp., p. 902.

2. Appendix G of part 36 is amended by revising section G36.107(a), G36.201(b), including Figure G1, G36.201(c), G36.201(d)(1), G36.201(d)(4), and G36.301(b), including Figure G2, to read as follows:

APPENDIX G TO PART 36 -- TAKEOFF NOISE REQUIREMENTS FOR PROPELLER-DRIVEN SMALL AIRPLANE AND PROPELLER-DRIVEN COMMUTER CATEGORY AIRPLANE CERTIFICATION TESTS ON OR AFTER DECEMBER 22, 1988

* * * * *

Sec. G36.107 Noise Measurement Procedures.

(a) The microphone must be 12.7 mm in diameter pressure type, with protective grid, mounted in an inverted position such that the microphone diaphragm is 7 mm above and parallel to a white-painted metal circular plate. This white-painted metal plate shall be 40 cm in diameter and at least 2.5 mm thick. The plate shall be placed horizontally and flush with the surrounding ground surface with no cavities below the plate. The microphone must be located three-quarters of the distance from the center to the edge of the plate along a radius normal to the line of flight of the test airplane.

* * * * *

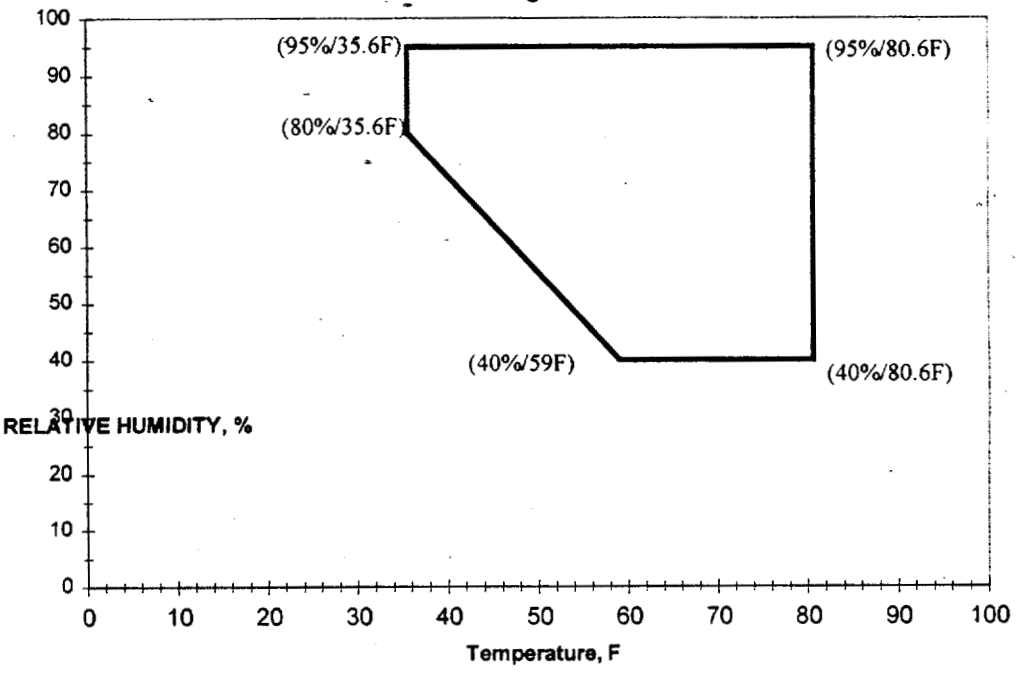
Sec. G36.201 Corrections to Test Results.

* * * * *

(b) Atmospheric absorption correction is required for noise data obtained when the test conditions are outside

those specified in Figure G1. Noise data outside the applicable range must be corrected to 59 F and 70 percent relative humidity by an FAA approved method.

MEASUREMENT WINDOW FOR NO ABSORPTION
Figure G1



(c) Helical tip Mach number and power corrections must be made as follows:

(1) Helical tip Mach number and power corrections must be made if --

(i) The propeller is a variable pitch type; or

(ii) The propeller is a fixed pitch type and the test power is not within 5 percent of the reference power.

(2) No corrections for helical tip Mach number variation need to be made if the propeller helical tip Mach number is:

(i) At or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.

(ii) Above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.

(iii) Above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

(d) * * *

(1) Measured sound levels must be corrected from test day meteorological conditions to reference conditions by adding an increment equal to

$$\text{Delta (M)} = (H_T\ \alpha - 0.7\ H_R)\ /1000$$

where H_T is the height in feet under test conditions, H_R is the height in feet under reference conditions when the

aircraft is directly over the noise measurement point and α is the rate of absorption for the test day conditions at 500 Hz as specified in SAE ARP 866A, entitled "Standard Values of Atmospheric Absorption as a function of Temperature and Humidity for use in Evaluating Aircraft Flyover Noise" as incorporated by reference under § 36.6.

* * * * *

(4) Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to

$$\text{Delta}(3) = K_3 \log (P_R/P_T)$$

where P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test airplane. In the absence of flight test data and at the discretion of the Administrator, a value of K_3 = 17 may be used.

* * * * *

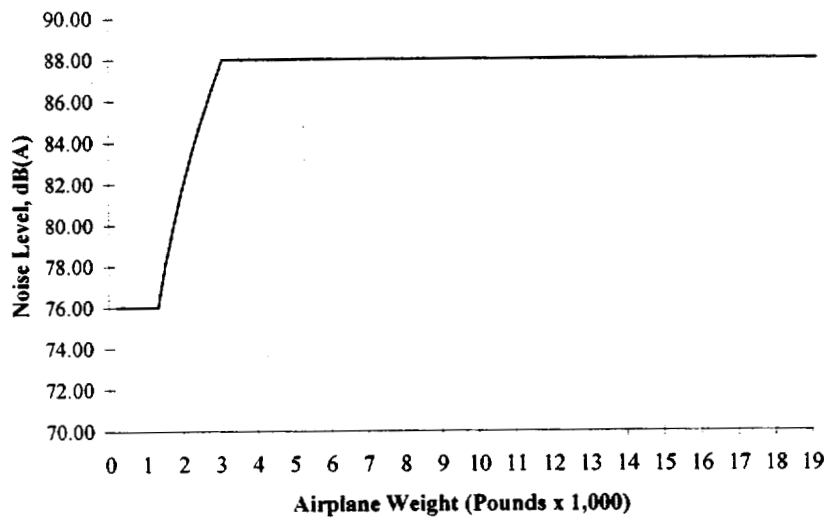
Sec. G36.301 Aircraft Noise Limits.

* * * * *

(b) (b) The noise level must not exceed 76 dB(A) up to and including aircraft weights of 1,320 pounds (600 kg). For

weights greater than 1,320 pounds the limit increases from that point with the logarithm of airplane weight at the rate of 9.83 dB (A) per doubling of weight until the limit of 88 dB (A) is reached after which the limit is constant up to and including 19,000 pounds (8,618 kg). Figure G2 shows noise level limits vs airplane weight.

NOISE LEVELS vs AIRPLANE WEIGHT
FIGURE G2



Issued in Washington, DC, on

U.S. Department
of Transportation

**FEDERAL AVIATION
ADMINISTRATION**

Washington, D.C. 20591

DRAFT REGULATORY EVALUATION, INITIAL REGULATORY FLEXIBILITY DETERMINATION, AND TRADE IMPACT ASSESSMENT

NOISE CERTIFICATION STANDARDS FOR PROPELLER-DRIVEN SMALL AIRPLANES

NOTICE OF PROPOSED RULEMAKING
(14 CFR PARTS 36)

OFFICE OF AVIATION POLICY AND PLANS
OPERATIONS REGULATORY ANALYSIS BRANCH, APO-310
Hazel L. Robinson
March 1998

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This regulatory evaluation examines the potential benefits and costs of the Notice of Proposed Rulemaking entitled "Noise Certification Standards for Propeller-Driven Small Airplanes." The primary goal of this rulemaking is to harmonize the U.S. noise certification regulations with the European Joint Aviation Requirements for propeller-driven small airplanes. The proposed changes would provide nearly uniform noise certification standards for airplanes certificated in the United States and in the European Joint Aviation Authorities countries. The harmonization of the noise certification standards would simplify airworthiness approvals for import and export.

The analysis concludes that the proposed rule would be cost beneficial to certificate holders.

The proposed rule would not have a significant impact on a substantial number of small entities. In addition, it would not constitute a barrier to international trade, and it does not contain a federal intergovernmental or private sector mandate that exceeds $100 million a year.

I. INTRODUCTION

This regulatory evaluation is performed in accordance with Executive Order 12866, which requires analysis of each regulation to determine the relationship of its benefits to costs. This evaluation examines the economic impact of this proposed rule that would harmonize the U.S. noise certification regulations with the European Joint Aviation Requirements for propeller-driven small airplanes. The proposed changes would provide nearly uniform noise certification standards for airplanes certificated in the United States and in the European Joint Aviation Authorities countries. In addition to the regulatory evaluation, this document also contains an Initial Regulatory Flexibility Determination, which analyzes the economic effect of the proposed regulatory changes on small entities, as required by the Regulatory Flexibility Act of 1980. This document also contains an assessment of the effect of the proposed regulatory changes on international trade, as required by the Office of Management and Budget. Finally, this document contains an Unfunded Mandate Assessment.

II. BACKGROUND

In June of 1990, the Federal Aviation Administration (FAA) and the Joint Aviation Authorities (JAA) agreed to harmonize their regulations. On May 3, 1994, the Aviation Rulemaking Advisory Committee (ARAC) established the Federal Aviation Regulations/Joint Aviation Regulations Harmonization Working Group for Propeller-Driven Small Airplanes (59 FR 22885). The Working Group was tasked with reviewing and harmonizing the applicable provisions of subparts A and

F, and appendices F and G of 14 CFR Part 36 "Noise Standards: Aircraft Type and Airworthiness Certification" with the corresponding applicable provisions of the Joint Aviation Regulation (JAR) Part 36. The Working Group was asked to consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. In addition the Working Group was tasked with recommending a process whereby subsequent ICAO, Annex 16, Volume 1 changes could be properly incorporated into JAR 36 and 14 CFR Part 36.

After reviewing 16 items related to noise limits and measurement procedures in the regulations, the Working Group recommended the following actions: 1) the JAR 36 should be amended to harmonize those regulations with 14 CFR Part 36 on four items; 2) 14 CFR part 36 should be amended to harmonize the regulations with the JAR on six items; and 3) no harmonization need be done for the remaining six items. The Working Group also recommended changes to harmonize FAA and JAA interpretive and advisory material relating to noise limits for propeller-driven small airplanes. This Notice of Proposed Rulemaking is based on harmonizing six items of Part 36 with JAR 36.

III. THE PROPOSED RULE

The proposed rule would modify Appendix G to Part 36--Takeoff Noise Requirements for Propeller-Driven Small Airplane And Propeller-

Driven, Commuter Category Airplane Certification Tests on or After December 22, 1988. The sections that would be affected are noise measurement procedures (§G36.107), four of the correction factors to test results (§G36.201), and specific aircraft noise limits that are tied to aircraft weight (§G36.301).

§G36.107 Noise Measurement Procedures

The proposed rule would affect the type and placement of microphones in the noise certification test. The current section requires that microphones be oriented in a known direction so that the maximum sound received arrives in the direction for which the microphones are calibrated and that the microphones sensing elements be placed four feet (1.2m) above ground level.

The proposed rule would require pressure type microphones with a protective grid that is 12.7 mm in diameter. These microphones would be mounted in inverted positions so that the diaphragms are 7mm above and parallel to white-painted metal circular plates. The plates would have to be 40 cm in diameter and at least 2.5 mm thick and placed horizontally and flush with the surrounding ground surface with no cavities below the plates. The microphones would have to be located three-quarters of the distance from the center to the edge of the plates along a radius normal to the line of flight of the test airplane.

§G36.201 "Corrections to Test Results

The proposed rule would amend this section by changing the atmospheric absorption correction temperatures and mathematical formulas in order to provide consistency with other sections of part 36 and to harmonize with the JAR.

The current §G36.201(b) requires atmospheric absorption correction for noise data obtained when the test conditions are outside those specified in appendix G, figure G1. Noise data outside the prescribed range is required to be corrected by an FAA approved method to 77 degrees F and 70 percent relative humidity. The proposed rule would change the 77 degrees F reference temperature to 59 degrees F; the 59 degrees reference temperature would be consistent with the ambient temperature in current section G36.111(b()(2) that is used for performance calculations.

The current §G36.201(c) requires that helical tip mach number and the power corrections of the test data must be made if the propeller is a variable pitch type or if the propeller is a fixed pitch type, whenever the test power is not within five percent of the reference power. The proposal would provide an additional exception by stating that a correction is not necessary if the helical tip mach number meets three additional tests.

1. The number is at or below 0.70 and the test helical tip mach number is within 0.014 of the reference helical tip mach number.

2. The number is above 0.70 , but equal to or below 0.80, and the test helical tip mach number is within 0.007 of the reference helical tip mach number.

3. The number is above 0.80 and the test helical tip mach number is within 0.005 of the reference helical tip mach number.

The current §G36.201(d)(1) requires that the measured sound levels be corrected from the test day meteorological conditions by adding an increment equal to the result gained from the following equation:

$$\text{Delta (M)} = (\alpha - 0.7)\ H_T\ /1000.^{1}$$

The proposed rule changes this formula to

$$\text{Delta (M)} = (H_T\alpha - 0.7H_R)/1000.^{2}$$

The proposed equation would bring appendix G absorption calculations in line with the rest of part 36 absorption calculations.

The current §G36.201(d)(4) requires that the measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to

$$\text{Delta (3)} = 17 \log (P_R\ /P_T).^{3}$$

The proposed rule would change the algebraic function for engine power to

$$\text{Delta (3)} = K_3 \log (P_R\ /p_T).^{4}$$

---

[1] In this equation, H_T is the height in feet of the test aircraft when directly over the noise measurement point and α is the rate of absorption of sound for the test day conditions at 500 H_z as referenced in SAE ARP 866A which is incorporated by reference in part 36.

[2] In this equation, H_T is the height in feet under test conditions, H_R is the height in feet under reference conditions when the aircraft is directly over the noise measurement point and α is the same as in the current rule, that is, the rate of absorption of sound for the test day conditions at 500 H_z as specified in SAE ARP 866A.

[3] P_T and P_R are the test and reference engine powers, respectively.

[4] P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. Under this proposal, the value of K_3 would be determined from approved data from the test airplane. In the absence of flight test data and at the

The only technical difference between the current formula and the proposed formula is the power correction constant. The proposed formula is consistent with the JAR.

§ G36.301 "Aircraft Noise limits"

The proposed rule would increase the noise limits that are tied to an aircraft weight. The section requires that the noise level not exceed 73 dB(A) for aircraft weights up to 1,320 pounds, and that for aircraft weights greater than 1,320 pounds the limit increases at the rate of 1 dB/165 pounds up to 85 dB(A) for aircraft weight of 3,300 pounds, after which the noise level limit is constant at 85 dB(A).

The proposed rule would increase the noise level from 73 dB(A) to 76 dB(A) and from 85 dB(A) to 88 dB(A), respectively. This change is to account for the microphone location and configuration requirements required in the proposed rule. It is not expected to result in any increase or decrease in the noise exposure requirements of the current rule.

In addition, the interpolation requirements for the noise limit would change. Instead of having the noise limit increase at the rate of 1 dB/165 pounds up to 85 dB(A) for aircraft weighing between 1,320 pounds and 3,300 pounds, but rather the noise limit would increase by the logarithm of airplane weight at the rate of 9.83 dB(A) per

---

discretion of the Administrator a value of K_3 =17 could still be used as under the current rule.

doubling of weight, until the limit of 88 dB(A) is reached of similar aircraft weighing the same pounds.

IV. ANALYSIS OF BENEFITS AND COSTS

A. Benefits

The primary benefits of the proposed rulemaking would be the harmonization and uniformity of noise certification standards and procedures for propeller driven small airplanes certificated in the United States and in the JAA countries. The resulting increase uniformity of noise certification standards would simplify and expedite noise certification approvals and would eliminate some of the costs that could result when manufacturers or operators seek type certifications under both, FAA and JAA, sets of noise certification standards.

Harmonizing the two noise certification regulations would also provide consistency between the two regulations. Harmonizing would also provide additional exceptions and exemptions to sections covering the calculation of measured sound levels.

By harmonizing the two regulations, there would be no stringency changes meaning an operator can not fail the noise certification test under the current rule and then pass under the proposed rule. The proposed rule would maintain the same high standards for meeting the noise level.

There would be a potential cost saving of $1,000 because only one certification test, instead of two, would have to be conducted. Each certification test costs approximately $1,000 to conduct. This cost savings is primarily labor savings; it takes additional time to prepare the site for two different tests, analyze two sets of data, as well as prepare and report two different sets of test results, one to the FAA and the other to the JAA.

B. Costs

The costs of the proposed rule would be negligible. Under the proposed rule, pressure type microphones mounted over a plate are required as compared to microphones that are mounted on tripods (current rule). The costs of both these types of microphones range between $800 - $1,000 per microphone.[5] The mounting equipment used in this process for current use and proposed (tripods and plates) are virtually the same at $100 per equipment. Additional capital expenditure cost would be the recording equipment. Under the current rule and proposed rule, a Designated Engineer Representative (DER) could use a sound level meter, digital tape recorder, or graphic level recorder to record noise. This equipment would cost between $3,000 and $50,000 per equipment. There would not be a cost differential for this equipment under both rules. The variable costs such as labor and reporting the results of the test to the FAA would

[5] Only one microphone is required in a noise certification test. A typical test would require at least 6 takeoffs and landings.

remain the same.[6] The FAA cost for evaluating and processing the noise certification tests would remain the same.[7]

Other proposed changes such as changing the reference temperatures, adding additional exceptions to a section, changing mathematical formulas, increasing the noise level ceiling and changing the interpolations requirement do no impose any additional cost on the manufacturers, DER or FAA officials.

C. Comparison of Benefits and Costs

If the proposed rule becomes effective, noise certification procedures would be consistent with the JAA procedures; this is expected to reduce the number of noise tests that need to be conducted. This harmonization would produce consistency and uniformity between appendix G, part 36 of the FAR and appendix G, part 36 of the JAR. Since there are no additional costs associated with implementing the proposal, the proposed rule is cost-beneficial.

V. INITIAL REGULATORY FLEXIBILITY DETERMINATION

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule would have a significant economic impact on a substantial number of small entities. Because the costs imposed by this rule would be

---

[6] Labor would consist of site preparation, analysis of noise recording tape, and reporting of results to the FAA.
[7] FAA official would witness the test.

negligible, the Agency concludes that the proposed rule would not have a significant impact on a substantial number of small entities.

VI. INTERNATIONAL TRADE IMPACT ASSESSMENT

The FAA has determined that the rule would promote the sale of foreign aviation products and services in the United States and the sale of U.S. products and services in foreign countries. This determination is based on the FAA's determination that the rule would align U.S. standards and JAA member standards for noise certification for propeller-driven small airplanes.

VII. UNFUNDED MANDATES

Title II of the Unfunded Mandates Reform Act of 1995 2 USC § 1501 (the Act), requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon State,

local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million a year, therefore the requirements of the act do not apply.

federal register

Wednesday
November 18, 1998

Part II

Department of Transportation

Federal Aviation Administration

14 CFR Part 36
Noise Certification Standards for Propeller-Driven Small Airplanes; Proposed Rule

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 36

[Docket No. FAA–1998–4731; Notice No. 98–16]

RIN 2120–AG65

Noise Certification Standards for Propeller-Driven Small Airplanes

AGENCY: Federal Aviation Administration, DOT.

ACTION: Notice of Proposed Rulemaking (NPRM).

SUMMARY: The FAA is proposing changes to the noise certification standards for propeller-driven small airplanes. These proposals are based on the joint effort of the Federal Aviation Administration (FAA), the European Joint Aviation Authorities (JAA), and Aviation Rulemaking Advisory Committee (ARAC), to harmonize the U.S. noise certification regulations and the European Joint Aviation Requirements (JAR) for propeller-driven small airplanes. These proposed changes would provide uniform noise certification standards for airplanes certificated in the United States and in the JAA countries. The harmonization of the noise certification standards would simplify airworthiness approvals for import and export purposes.

DATES: Comments must be received on or before January 19, 1999.

ADDRESSES: Comments on this proposed rulemaking should be mailed or delivered, in duplicate, to: U.S. Department of Transportation Dockets, Docket No. FAA–1998–4731, 400 Seventh Street, SW., Room Plaza 401, Washington, DC 20590. Comments may also be sent electronically to the following Internet address: 9-NPRM-CMTS@faa.dot.gov. Comments may be filed and/or examined in Room Plaza 401 between 10 a.m. and 5 p.m. weekdays except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Mehmet Marsan, Office of Environment and Energy (AEE), Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267–7703.

SUPPLEMENTARY INFORMATION:

Comments Invited

Interested persons are invited to participate in the making of the proposed rule by submitting such written data, views, or arguments as they may desire. Comments relating to the environmental, energy, federalism, or economic impact that might result from adopting the proposals in this notice are also invited. Substantive comments should be accompanied by cost estimates. Comments must identify the regulatory docket or notice number and be submitted in triplicate to the Rules Docket address specified above.

All comments received, as well as a report summarizing each substantive public contact with FAA personnel on this rulemaking, will be filed in the docket. The docket is available for public inspection before and after the comment closing date.

All comments received on or before the closing date will be considered by the Administrator before taking action on this proposed rulemaking. Late-filed comments will be considered to the extent practicable. The proposals contained in this notice may be changed in light of the comments received. Commenters wishing the FAA to acknowledge receipt of their comments submitted in response to this notice must include a pre-addressed, stamped postcard with those comments on which the following statement is made: "Comments to Docket No. FAA–1998–4731." The postcard will be date stamped and mailed to the commenter.

Availability of the NPRM

An electronic copy of this document can be downloaded using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: 703–321–3339), the *Government Printing Office's* electronic bulletin board service (telephone: 202–512–1661).

Internet users may reach the FAA's web page at http://www.faa.gov or the *Government Printing Office's* webpage at http://www.access.gpo.gov/nara for access to recently published rulemaking documents.

Any person may obtain a copy of this NPRM by mail by submitting a request to the Federal Aviation Administration, Office of Rulemaking, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9677. Communications must identify the notice number of this NPRM.

Persons interested in being placed on the mailing list for future NPRM's should request from the FAA's Office of Rulemaking a copy of Advisory Circular No. 11–2A, Notice of Proposed Rulemaking Distribution System, that describes the application procedure.

Background

Current Regulations

Under 49 U.S.C. 44715, the Administrator of the Federal Aviation Administration is directed to prescribe "standards to measure aircraft noise and sonic boom; * * * and regulations to control and abate aircraft noise and sonic boom." Part 36 of Title 14 of the Code of Federal Regulations contains the FAA's noise standards and regulations that apply to the issuance of type certificates for all types of aircraft. The standards and requirements that apply to propeller-driven small airplanes and propeller-driven commuter category airplanes are found in § 36.501 and Appendix G of Part 36. Appendix G addresses Takeoff Noise Requirements for propeller-driven small airplane and propeller-driven commuter category airplane Certification Tests on or after December 22, 1988. This appendix was added to part 36 in 1988 to require actual takeoff noise tests instead of the level flyover test that was formerly required under Appendix F, for airplanes for which certification tests were completed before December 22, 1988.

Appendix G specifies the test conditions, procedures, and noise levels necessary to demonstrate compliance with certification requirements for propeller driven small airplanes and propeller-driven, commuter category airplanes.

Government and Industry Cooperation

In June 1990 there was a meeting of the Joint Aviation Authorities (JAA) Council, which consists of JAA members from European countries, and the FAA. The FAA Administrator committed FAA to support the harmonization of the FAA regulations with the Joint Aviation Regulations (JAR). The Joint Aviation Regulations are being developed for use by the European authorities that are member countries of the JAA.

In January 1991, the FAA established the Aviation Rulemaking Advisory Committee to serve as a forum for the FAA to obtain input from outside the Government on major regulatory issues facing the agency. The FAA announced the renewal of ARAC on February 19, 1993 (58 FR 9230) and on March 1, 1995 (60 FR 11165). One area that ARAC deals with is noise certification issues. These issues involve the harmonization of 14 CFR part 36 (part 36) with JAR part 36, the associated guidance material including equivalent procedures, and the interpretation of the regulations. On May 3, 1994, the ARAC established the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes (59 FR 22885). The Working Group was tasked with reviewing the applicable provisions of subparts A and F, and appendices F and

G of part 36, and harmonizing them with the corresponding applicable provisions of JAR 36. The Working Group was asked to consider the current international standards and recommended practices, as issued under International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. The Working Group was also asked to recommend a process whereby subsequent ICAO Annex 16 changes could be properly incorporated into JAR 36 and part 36.

The Working Group reviewed 16 items related to noise limits and measurement procedures in the regulations. For six of these items, the Working Group recommended that part 36 be amended to harmonize the regulations with JAR 36: For four of these items, the Working Group recommended that JAR 36 be amended to harmonize those regulations with part 36. For the six remaining items, the Working Group found that no harmonization is necessary. The Working Group also recommended changes to harmonize FAA and JAA interpretive and advisory material relating to noise limits for propeller-driven small airplanes. This NPRM reflects the six recommendations that address changes to part 36.

Discussion of Proposals

The proposed changes to appendix G would affect the provisions that establish noise measurement procedures (sec. G36.107), corrections to test results (sec. G36.201) and specific aircraft noise limits that are tied to aircraft weight (sec. G36.301).

Section G36.107 Noise Measurement Procedures

Currently, section G36.107 prescribes specific procedures for the placement of microphones, system calibration and consideration of ambient noise. The proposed changes would affect the microphone requirements of paragraph (a). Currently, microphones are required to be oriented in a known direction so that the maximum sound received arrives as nearly as possible in the direction for which the microphones are calibrated, and the microphone sensing elements must be placed four feet (1.2 m) above ground level.

The proposed change to section G36.107(a) would require the microphone to be a pressure-type microphone with a protective grid that is 12.7 mm in diameter. The microphone would have to be mounted in an inverted position so that the diaphragm is 0.7 mm above and parallel to a white-painted metal circular plate. The plate would have to be 40 cm in diameter and at least 2.5 mm thick. The plate would have to be placed horizontally and flush with the surrounding ground surface with no cavities below the plate. The microphone would have to be located three-quarters of the distance from the center to the edge of the plate along a radius normal to the line of flight of the test airplane.

The proposed changes, which would make the U.S. regulations consistent with the JAR, are supported by numerous studies, technical papers, and discussions with interested groups. The technical data indicate that an inverted microphone that measures reflected noise from a metal plate at ground level produces more consistent and reliable data. A microphone that is four feet above the ground is much more likely to be affected by variable ground reflections that can interact with the noise produced by the aircraft being measured. The microphone height reduction and the metal plate substantially eliminate these variations.

However, studies also show that measurements using the inverted microphone and metal plate technique produce consistently higher noise levels than those produced under the current procedure, with the difference being about 3 dB(A). Therefore, to maintain the present level of noise stringency, a corresponding change to section G36.301(b) is necessary as discussed below.

Section G36.201 Corrections to Test Results

Current section G36.201 prescribes corrections to be made to test results to account for the effects of differences between the conditions referenced in the prescribed procedures and existing conditions during an actual test.

Current section G36.201(b) requires atmospheric absorption correction for noise data obtained when the test conditions are outside those specified in appendix G, figure G1. Noise data collected outside the prescribed range of figure G1 are required to be corrected to 77 degrees F and 70 percent relative humidity by an FAA approved method. The FAA is proposing to change the 77 degrees F reference temperature to 59 degrees F, to be consistent with the ambient temperature requirement in current section G36.111(b)(2) that is used for performance calculations. By making the reference temperatures consistent for absorption and performance, delays and confusion that have been caused by the inconsistency in the current rule would be eliminated. The change would bring part 36 in line with Annex 16.

Current section G36.201(c) requires that helical tip Mach number and power corrections must be made if the propeller is a variable pitch type or if the propeller is a fixed pitch type and the test power is not within five percent of the reference power. The proposed change would provide an additional exception by stating that a correction is not necessary if the helical tip Mach number meets one of the following:

1. The number is at or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.
2. The number is above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.
3. The number is above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

These additional proposed exceptions are based on an analysis of noise data from nine U.S.-manufactured aircraft. This analysis indicated that the proposed values are well within the Type 1 sound level meter as defined in International Electrotechnical Commission (IEC) Publication No. 651, which has been incorporated by reference in part 36. Adding this exemption would simplify some tests without degrading the results.

Current section G36.201(d)(1) requires that the measured sound levels must be corrected from the test day meteorological conditions by adding an increment equal to the result gained from the following equation:

Delta (M)=(α − 0.7) H_T/1000.

In this equation, H_T is the height in feet of the test aircraft when directly over the noise measurement point, and α is the rate of absorption for the test day conditions at 500 Hz as referenced in Society of Automotive Engineers (SAE) Publication Aerospace Recommended Practice (ARP) 866A which has been incorporated by reference in part 36.

The equation in section G36.201(d)(1) is an approximation. The accuracy of the calculations can be improved by adopting the exact form of the equation. Therefore, the FAA proposes to change the equation to the exact form which reads as follows:

Delta (M)=($H_T\alpha$ − 0.7 H_R)/1000.

In this equation H_T is the height in feet under test conditions, H_R is the height in feet under reference

conditions when the aircraft is directly over the noise measurement point, and α is the same as in the current rule, that is, the rate of absorption for the test day conditions at 500 Hz as specified in SAE ARP 866A.

The proposed equation would bring appendix G absorption calculations in line with the rest of part 36 absorption calculations and Annex 16.

Current section G36.201(d)(4) requires that the measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to:

Delta (3)=17 log (P_R/P_T)

where P_T and P_R are the test and reference engine powers respectively.

The FAA proposes that the algebraic correction for engine power be changed to:

Delta (3)=K_3 log (P_R/P_T)

where P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. Under this proposal, the value of K_3 would be determined from approved data from the test airplane. In the absence of flight test data and at the discretion of the Administrator a value of K_3 = 17 could still be used as under the current rule.

The only difference between the current formula and the proposed formula is the power correction constant. The current regulation requires the use of 17 for this constant. The K_3=17 value is an average value that was derived from FAA tests on seven aircraft where the variation was from 1.5 to 39.3. Although the use of an average value simplifies the test plan, it could penalize an applicant who can prove lower values of K_3 by test data. Therefore, the FAA proposes a formula that allows the applicant to use a lower value for K_3 when it has test data to support that value, or to continue to use a value of 17 with the Administrator's approval when test data is not available. The proposed formula is also consistent with the JAR.

Section G36.301 Aircraft Noise Limits

Current section G36.301(b) states that the noise level must not exceed 73 dB(A) up to and including aircraft weights of 1,320 pounds (600 kg.), and that for weights greater than 1,320 pounds the noise limit increases at the rate of 1 dB/165 pounds up to 85 dB(A) at 3,300 pounds, after which it is constant at 85 dB(A) up to and including 19,000 pounds.

As previously discussed, considerations of microphone location, configuration, and resulting noise limits are interrelated. Since the proposed changes to the noise measurement procedures of section G36.107(a) would result in increases in the measured noise levels of about 3 dB(A), the FAA proposes to increase the limits in section 36.301(b) from 73 dB(A) to 76 dB(A) and from 85 dB(A) to 88 dB(A). This change would account for the revised microphone height and configuration requirements. The increased limit is not expected to result in any increase or decrease in the noise stringency requirements of the current rule.

In addition to the dB(A) changes discussed, the FAA is proposing a change to the interpolation requirement of section G36.301(b). For weights greater than 1,320 pounds, the allowable dB(A) would increase "with the logarithm of airplane weight at the rate of 9.83 dB(A) per doubling of weight until the limit of 88 dB(A) is reached * * *," rather than at the rate of 1 dB/165 pounds up to 85 dB(A) at 3,300 pounds, as under the current rule. This change would harmonize interpolation under the FAA regulation with the comparable JAA regulation without change in noise stringency of the present Appendix G.

Paperwork Reduction Act

There are no requirements for information collection associated with this proposed rule that would require approval under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*)

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA's policy to comply with ICAO Standards and Recommended Practices to the maximum extent practicable. For this NPRM, the FAA has reviewed part 36 Appendix G and ICAO Annex 16 Volume I, Chapter 10. The review showed that the following two items were left unharmonized: (1) For fixed pitch type propellers, part 36 section G36.201 specifies a simplified data correction procedure if the engine test power is within 5% of the reference power. The Annex 16 does not have a corresponding simplification and, (2) The part 36 section G36.111 allows the use of maximum continuous installed power during the second segment of the flight path. The power definition in Annex 16 for the second segment is defined as maximum power in Chapter 10 section 10.5.2. The maximum installed power is typically lower than the maximum power and applicable only to older engines. The above two unharmonized items only effect a small percentage of the airplanes in the fleet and therefore are not significant enough to be considered as harmonization issues.

Regulatory Evaluation Summary

Four principal requirements pertain to the economic impacts of changes to the Federal Regulations. First, Executive Order 12866 directs Federal agencies to promulgate new regulations or modify existing regulations after consideration of the expected benefits to society and the expected costs. Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. Finally, Public Law 104-4 requires federal agencies to assess the impact of any federal mandates on state, local, tribal government, and the private sector. In conducting these analyses, the FAA has determined that this rule: (1) would generate cost savings that would exceed any costs; (2) is not "significant" as defined under section 3(f) of Executive Order 12866 and Department of Transportation's (DOT) policies and procedures (44 FR 11034, February 26, 1979); (3) would not have a significant impact on a substantial number of small entities; and (4) would not impose restraints on international trade. Finally, the FAA has determined that the proposal would not impose a federal mandate on state, local, or tribal governments, or the private sector of $100 million per year. These analyses, available in the docket, are summarized below.

The benefit of the proposed rule is that it would harmonize the U.S. noise certification regulations with the European Joint Aviation Requirements for propeller-driven small airplanes. The proposed changes would provide nearly uniform noise certification standards for airplanes certificated in the United States and by the European Joint Aviation Authorities (JAA). This is expected to reduce the number of noise tests that need to be conducted. The costs to implement the proposal are negligible, if any. There are no additional costs imposed by this proposal.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by government regulations. The RFA requires a Regulatory Flexibility Analysis if a rule would have a significant economic impact on a

substantial number of small entities. Because the costs imposed by this rule would be negligible, the Agency concludes that the proposed rule would not have a significant economic impact on a substantial number of small entities.

International Trade Impact Statement

The FAA has determined that the proposed rule would promote the sale of foreign products and services in the United States and the sale of U.S. products and services in foreign countries. This determination is based on the FAA's determination that the rule would align U.S. standards and JAA member standards for noise certification for propeller-driven small airplanes.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment (EA) or environmental impact statement (EIS). In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), regulations, standards, and exemptions (excluding those, which if implemented may cause a significant impact on the human environment) qualify for a categorical exclusion. The FAA proposes that this rule qualifies for a categorical exclusion because no significant impacts to the environment are expected to result from its finalization or implementation. In accordance with FAA Order 1050.1D, paragraph 32, the FAA proposes that there are no extraordinary circumstances warranting preparation of an environmental assessment for this proposed rule.

Federalism Implications

The proposed regulations would not have substantial direct effects on the states, on the relationship between national government and the states, or on the distribution of power and responsibilities among various levels of government. Thus, in accordance with Executive Order 12612, it is determined that such a regulation would not have federalism implications warranting the preparation of a Federalism Assessment.

Unfunded Mandates

Title II of the Unfunded Mandates Reform Act of 1995 (the Act), enacted as Pub. L. 104-4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a proposed or final agency rule that may result in the expenditure by State, local, and tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year. Section 204(a) of the Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, local, and tribal governments on a proposed "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Act is any provision in a Federal agency regulation that would impose an enforceable duty upon State, local, and tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year. Section 203 of the Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million a year, therefore the requirements of the Act do not apply.

List of Subjects in 14 CFR Part 36

Agriculture, Aircraft, Noise control.

The Proposed Amendments

In consideration of the foregoing, the Federal Aviation Administration proposes to amend 14 CFR part 36 as follows:

PART 36—NOISE STANDARDS: AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATION

1. The authority citation for part 36 continues to read as follows:

Authority: 42 U.S.C. 4321 *et seq.*; 49 U.S.C. 106(g), 40113, 44701-44702, 44704, 44715; sec. 305, Pub. L. 96-193, 94 Stat. 50, 57; E.O. 11514, 35 FR 4247, 3 CFR, 1966-1970 Comp., p. 902.

2. Appendix G of part 36 is amended by revising sections G36.107(a), G36.201(b), including Figure G1, G36.201(c), G36.201(d)(1), G36.201(d)(4), and G36.301(b), including Figure G2, to read as follows:

Appendix G to Part 36—Takeoff Noise Requirements for Propeller-Driven Small Airplane and Propeller-Driven Commuter Category Airplane Certification Tests on or After December 22, 1988

* * * * *

Sec. G36.107 Noise Measurement Procedures.

(a) The microphone must be a pressure type, 12.7 mm in diameter, with a protective grid, mounted in an inverted position such that the microphone diaphragm is 0.7 mm above and parallel to a white-painted metal circular plate. This white-painted metal plate shall be 40 cm in diameter and at least 2.5 mm thick. The plate shall be placed horizontally and flush with the surrounding ground surface with no cavities below the plate. The microphone must be located three-quarters of the distance from the center to the back edge of the plate along a radius normal to the line of flight of the test airplane.

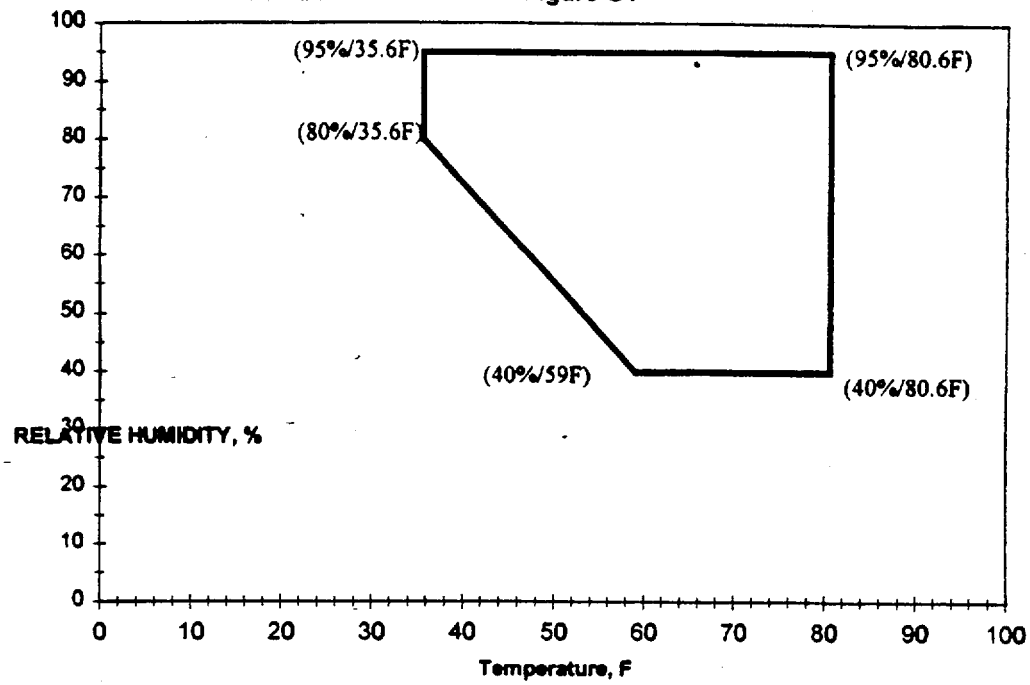
* * * * *

Sec. G36.201 Corrections to Test Results.

* * * * *

(b) Atmospheric absorption correction is required for noise data obtained when the test conditions are outside those specified in Figure G1. Noise data outside the applicable range must be corrected to 59 F and 70 percent relative humidity by an FAA approved method.

MEASUREMENT WINDOW FOR NO ABSORPTION CORRECTION Figure G1



BILLING CODE 4910-13-C

(c) Helical tip Mach number and power corrections must be made as follows:

(1) Corrections for helical tip Mach number and power corrections must be made if—

(i) The propeller is a variable pitch type; or

(ii) The propeller is a fixed pitch type and the test power is not within 5 percent of the reference power.

(2) No corrections for helical tip Mach number variation need to be made if the propeller helical tip Mach number is:

(i) At or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.

(ii) Above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.

(iii) Above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

(d) * * *

(1) Measured sound levels must be corrected from test day meteorological conditions to reference conditions by adding an increment equal to—

$$\text{Delta (M)} = (H_T \alpha - 0.7\ H_R)/1000$$

where H_T is the height in feet under test conditions, H_R is the height in feet under reference conditions when the aircraft is directly over the noise measurement point and α is the rate of absorption for the test day conditions at 500 Hz as specified in SAE ARP 866A, entitled "Standard Values of Atmospheric Absorption as a function of Temperature and Humidity for use in Evaluating Aircraft Flyover Noise" as incorporated by reference under § 36.6.

* * * * *

(4) Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to—

$$\text{Delta(3)} = K_3 \log (P_R/P_T)$$

where P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test airplane. In the absence of flight test data and at the discretion of the Administrator, a value of $K_3 = 17$ may be used.

* * * * *

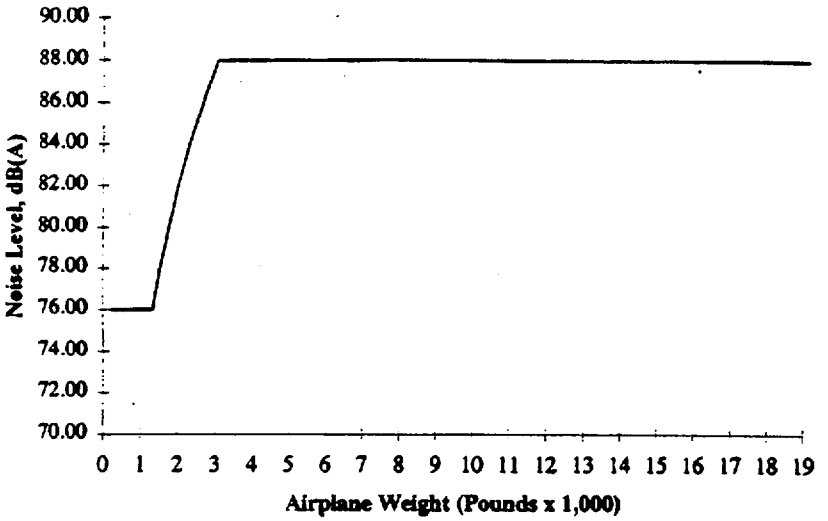
Sec. G36.301 Aircraft Noise Limits.

* * * * *

(b) The noise level must not exceed 76 dB (A) up to and including aircraft weights of 1,320 pounds (600 kg). For aircraft weights greater than 1,320 pounds, the limit increases from that point with the logarithm of airplane weight at the rate of 9.83 dB (A) per doubling of weight, until the limit of 88 dB (A) is reached, after which the limit is constant up to and including 19,000 pounds (8,618 kg). Figure G2 shows noise level limits vs airplane weight.

BILLING CODE 4910-13-P

NOISE LEVELS vs AIRPLANE WEIGHT
FIGURE G2



BILLING CODE 4910-13-C

Issued in Washington, DC, on November 9, 1998.

James D. Erickson,

Director of Office of Environment and Energy.

[FR Doc. 98-30578 Filed 11-17-98; 8:45 am]

BILLING CODE 4910-13-P

MAR 2 1999

Mr. David A. Hilton
Aviation Rulemaking Advisory Committee
Noise Certification Issues
P.O. Box 2206 M/S D04
Savannah, GA 31402-2206

Dear Mr. Hilton:

In response to a task announced in the Federal Register on May 3, 1994 (59 FR 22885) and revised task announced on October 17, 1995, (60 FR 53826) the Aviation Rulemaking Advisory Committee (ARAC) developed a notice of proposed rulemaking (NPRM) to change noise certification standards for propeller-driven small airplanes. The NPRM was published in the Federal Register on November 18, 1998 and the comment period closed on January 19, 1999. Comments received in response to the NPRM were considered to be non-substantive. Consequently, the final action will be developed internally by the Federal Aviation Administration (FAA).

Let me thank ARAC and, in particular, the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes for its dedicated efforts in completing the task assigned by the FAA.

If you have any questions, please contact Mr. Paul Dykeman at (202) 267-3577.

Sincerely,

Original Signed
Brenda D. Courtney

Brenda D. Courtney
Acting Director, Office of Rulemaking

federal register

Wednesday
October 13, 1999

Part III

Department of Transportation

Federal Aviation Administration

14 CFR Part 36

Noise Certification Standards for Propeller-Driven Small Airplanes; Final Rule

Prop. Driven

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 36

[Docket No. FAA–1998–4731; Amendment No. 36–22]

RIN 2120–AG65

Noise Certification Standards for Propeller-Driven Small Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is amending the noise certification standards for propeller-driven small airplanes. These changes are based on the joint effort of the Federal Aviation Administration (FAA), the European Joint Aviation Authorities (JAA), and Aviation Rulemaking Advisory Committee (ARAC), to harmonize the U.S. noise certification regulations and the European Joint Aviation Requirements (JAR) for propeller-driven small airplanes. These changes will provide uniform noise certification standards for airplanes certificated in the United States and in the JAA countries. The harmonization of the noise certification standards will simplify airworthiness approvals for import and export purposes.

EFFECTIVE DATE: December 13, 1999.

FOR FURTHER INFORMATION CONTACT: Mehmet Marsan, Office of Environment and Energy (AEE), Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267–7703.

SUPPLEMENTARY INFORMATION:

Availability of Final Rules

An electronic copy of this document can be downloaded using a modem and suitable communications software from the FAA regulations section of the Fedworld electronic bulletin board service (telephone: (703) 321–3339) or, the Government Printing Office's (GPO) electronic bulletin board service (telephone: (202) 512–1661).

Internet users may reach the FAA's web page at http://www.faa.gov/avr/arm/nprm/nprm.htm or the GPO's web page at http://www.access.gpo.gov/nara for access to recently published rulemaking documents.

Any person may obtain a copy of this document by submitting a request to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue, SW., Washington, DC 20591, or by calling (202) 267–9680. Communications must identify the amendment number or docket number of this final rule.

Persons interested in being placed on the mailing list for future rulemaking documents should request from the above office a copy of Advisory Circular No. 11–2A, Notice of Proposed Rulemaking Distribution System, which describes the application procedure.

Small Entity Inquiries

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996, requires the FAA to comply with small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. Therefore, any small entity that has a question regarding this document may contact their local FAA official. Internet users can find additional information on SBREFA in the "Quick Jump" section of the FAA's web page at *http://www.faa.gov* and may send electronic inquiries to the following Internet address: *9-AWA-SBREFA@faa.gov.*

Background

Current Regulations

Under 49 U.S.C. 44715, the Administrator of the Federal Aviation Administration is directed to prescribe "standards to measure aircraft noise and sonic boom; * * * and regulations to control and abate aircraft noise and sonic boom." Part 36 of Title 14 of the Code of Federal Regulations contains the FAA's noise standards and regulations that apply to the issuance of type certificates for all types of aircraft. The standards and requirements that apply to propeller-driven small airplanes and propeller-driven commuter category airplanes are found in § 36.501 and Appendix G to Part 36. Appendix G addresses Takeoff Noise Requirements for Propeller-Driven Small Airplane and Propeller-Driven Commuter Category Airplane Certification Tests on or after December 22, 1988. This appendix was added to part 36 in 1988 to require an actual takeoff noise test instead of the level flyover test that is required under Appendix F, and applies only to airplanes for which certification tests were completed before December 22, 1988.

Appendix G specifies the test conditions, procedures, and noise levels necessary to demonstrate compliance with certification requirements for propeller driven small airplanes and propeller-driven commuter category airplanes.

Government and Industry Cooperation

In June 1990 at a meeting of the Joint Aviation Authorities (JAA) Council, which consists of JAA members from European countries and the FAA, the FAA Administrator committed the FAA to support the harmonization of the U.S. regulations with the Joint Aviation Regulations (JAR). The Joint Aviation Regulations are being developed for use by the European authorities that are member countries of the JAA.

In January 1991, the FAA established the Aviation Rulemaking Advisory Committee to serve as a forum for the FAA to obtain input from outside the government on major regulatory issues facing the agency. The FAA has tasked ARAC with noise certification issues. These issues involve the harmonization of 14 CFR part 36 (part 36) with JAR part 36, the associated guidance material including equivalent procedures, and the interpretation of the regulations. On May 3, 1994, the ARAC established the Harmonization Working Group for Propeller-Driven Small Airplanes (59 FR 22885). The working group was tasked with reviewing the applicable provisions of subparts A and F, and appendices F and G of part 36, and harmonizing them with the corresponding applicable provisions of JAR 36. The working group was tasked to consider the current international standards and recommended practices, as issued under International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of the harmonization proposals. The working group was also asked to recommend a process whereby subsequent ICAO Annex 16 changes could be easily incorporated into JAR 36 and part 36.

The working group reviewed 16 items related to noise limits and measurement procedures for propeller driven small airplanes in the regulations. For six of these items, the working group recommended that Appendix G of part 36 be amended to harmonize the regulations with JAR 36. For four of these items, the working group recommended that Chapter 10 of JAR 36 be amended to harmonize those regulations with part 36. For the six remaining items, the working group found that no harmonization is necessary. The working group also recommended changes to harmonize FAA and JAA interpretive and advisory material relating to noise limits for propeller-driven small airplanes. The ARAC agreed with the working group's recommendations and they were forwarded to the FAA for consideration.

On November 18, 1998, the FAA published Notice No. 98–16 entitled "Noise Certification Standards for Propeller-Driven Small Airplanes," (63

FR 64146). The notice reflected the six recommendations that address changes to part 36. The FAA solicited comments on the proposals, which are discussed in the following section. This final rule is based on Notice No. 98–16.

Discussion of Comments

The changes to appendix G of part 36 will affect the provisions that establish noise measurement procedures (§ G36.107), corrections to test results (§ G36.201) and specific aircraft noise limits that are tied to aircraft weight (§ G36.301).

There were a total of four comments in response to the proposed rule. Two commenters were in agreement with the proposed rule—the General Aviation Manufacturers Association (GAMA) and Transport Canada. The other two commenters were the French DGAC (Direction Generale de l'Aviation Civile) and Aeromod Services, Inc. The two latter comments are discussed below.

Section G36.107 Noise Measurement Procedures

Currently, § G36.107 prescribes specific procedures for the placement of microphones, system calibration and consideration of ambient noise. The FAA proposed changes to affect the microphone requirements of paragraph (a) of that section. Currently, microphones are required to be oriented in a known direction so that the maximum sound received arrives as nearly as possible in the direction for which the microphones are calibrated, and the microphone sensing elements must be placed four feet (1.2 m) above ground level.

The FAA proposed changing § G36.107(a) to require the microphone to be a pressure-type microphone with a protective grid that is 12.7 mm in diameter. The microphone would have to be mounted in an inverted position so that the diaphragm is 7 mm above and parallel to a white-painted metal circular plate. The plate would have to be 40 cm in diameter and at least 2.5 mm thick. The plate would have to be placed horizontally and flush with the surrounding ground surface with no cavities below the plate. The microphone would have to be located three-quarters of the distance from the center to the edge of the plate along a radius normal to the line of flight of the test airplane. To maintain the present level of noise stringency, a corresponding change to § G36.301(b) would also be necessary, as discussed below.

Comments

The French DGAC comments that in paragraph (a), the figure "0.7 mm" should be replaced with "7 mm" to harmonize with ICAO Annex 16 and JAR 36. The commenter says that "7 mm" is the figure used in Paragraph 4.4 of Appendix 6 of Annex 16, vol. 1, as well as in Paragraph 4.4 of Appendix B of JAR 36.

Aeromod Services, Inc. has no objection to the proposed change. The commenter says that using a ground plane microphone provides data that are applicable to both FAA and ICAO certification activities, eliminating duplication of equipment or testing. The commenter says that the additional equipment requirement adds negligible cost to the test.

FAA Response

The FAA agrees with the DGAC's comment. An error occurred in the NPRM. The value 0.7 mm should be changed to 7 mm wherever that value applies.

Section G36.201 Corrections to Test Results

Current § G36.201 prescribes corrections to be made to test results to account for the effects of differences between the conditions referenced in the prescribed procedures and existing conditions during an actual test.

Current § G36.201(b) requires atmospheric absorption correction for noise data obtained when the test conditions are outside those specified in appendix G, figure G1. Noise data collected outside the prescribed range of figure G1 are required to be corrected to 77 degrees Fahrenheit and 70 percent relative humidity by an FAA approved method. The FAA proposed changing the 77 degrees Fahrenheit reference temperature to 59 degrees Fahrenheit, to be consistent with the ambient temperature requirement in current § G36.111(b)(2), that is used for performance calculations.

Current § G36.201(c) requires that helical tip Mach number and power corrections must be made if the propeller is a variable pitch type or if the propeller is a fixed pitch type and the test power is not within five percent of the reference power. The FAA proposed changing this paragraph to provide an additional exception to the tip Mach number correction by stating that a correction is not necessary if the helical tip Mach number meets one of the following:

1. The number is at or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.

2. The number is above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.

3. The number is above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

Current § G36.201(d)(1) requires that the measured sound levels must be corrected from the test day meteorological conditions by adding an increment equal to the result gained from the following equation:

$$\text{Delta (M)} = (\alpha - 0.7)\ H_T/1000.$$

In this equation, H_T is the height in feet of the test aircraft when directly over the noise measurement point, and α is the rate of absorption for the test day conditions at 500 Hertz as referenced in Society of Automotive Engineers (SAE) Publication Aerospace Recommended Practice (ARP) 866A, which has been incorporated by reference in part 36.

The equation in § G36.201(d)(1) is an approximation. The accuracy of the calculations can be improved by adopting the exact form of the equation. Therefore, the FAA proposed changing the equation to the exact form which reads as follows:

$$\text{Delta (M)} = (H_T\ \alpha - 0.7\ H_R)/1000.$$

In this equation, H_T is the height in feet under test conditions, H_R is the height in feet under reference conditions when the aircraft is directly over the noise measurement point, and α is the rate of absorption for the test day conditions at 500 Hertz as specified in SAE ARP 866A, the same as the current rule.

The proposed equation would make Appendix G absorption calculations the same as the rest of part 36 and Annex 16 absorption calculations.

Current § G36.201(d)(4) requires that the measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to:

$$\text{Delta (3)} = 17 \log (P_R/P_T)$$

where P_T and P_R are the test and reference engine powers respectively.

The FAA proposed that the algebraic correction for engine power be changed to:

$$\text{Delta (3)} = K_3 \log (P_R/P_T)$$

where P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. Under this proposal, the value of K_3 would be

determined from approved data from the test airplane. In the absence of flight test data and at the discretion of the Administrator, a value of $K_3 = 17$ could still be used as under the current rule.

Comments on Section G36.201(b)

Aeromod Services, Inc. objects to changing the 77 degree Fahrenheit reference temperature to 59 degree Fahrenheit in paragraph (b) because it "harmonizes in the wrong direction." The commenter says that the section should be "placed on the list for JAR 36 harmonization with FAR 36." Aeromod's comment goes on to state:

> If we examine the existing FAA and ICAO noise rules, we find that the only rule which does not have a primary or absolute acoustical reference day defined by 77°F/70%RH is Annex 16, Chapter 10. All of the other noise rules, to include FAR 36 Appendix A, Current Appendix G, Appendix H, ICAO Annex 16 Chapter 3, Chapter 4, and Chapter 8, use 77°F/70%RH as the primary or absolute acoustical reference day.

Aeromod adds that there appears to be "no instance of confusion and delay caused by the difference in performance and acoustic reference conditions, as is mentioned in the Notice."

FAA Response

Aeromod comments that the only section of part 36 which does not have both the performance and acoustic reference day conditions as 77 degree Fahrenheit and 70 percent relative humidity is Appendix G. The reason for this apparent inconsistency is based on the different noise characteristics of other airplane classes, namely large transports and helicopters. Propeller-driven small airplane noise levels are dominated by the low frequency tone noise under 500 Hz. Other classes of airplanes have noise characteristics that can be concentrated at higher frequencies. This difference in noise characteristics is reflected in the regulations by the different atmospheric absorption correction requirements for each class of airplanes.

The regulation requires that an atmospheric absorption correction at 500 Hz 1/3-octave-band frequency must be applied to the measured noise levels of propeller-driven small airplanes. For large transports and helicopters, the measured levels have to be corrected to reference conditions of 77 degree Fahrenheit by applying atmospheric absorption correction for each 1/3-octave-band frequency. The atmospheric absorption is minimal at 500 Hz and increases with the increase in frequency. The correction is always small for propeller-driven small airplanes and can be very large for other classes of airplanes. The choice of the 77 degree Fahrenheit reference temperature assures that the measured levels are corrected upwards for most large transport and helicopter tests since a typical test temperature is lower than 77 degree Fahrenheit. If a low reference temperature was chosen, the cumulative effect of the corrections could become positive or negative depending on the frequency content of the noise from the large transport and helicopters being tested. This effort would benefit some aircraft and unfairly penalize other aircraft depending on the test day temperature and frequency content. The high reference temperature of 77 degree Fahrenheit removes this uncertainty for large transport and helicopter noise certification testing.

However, the small atmospheric absorption correction values at low frequencies for propeller-driven airplanes do not warrant the use of a reference atmospheric temperature of 77 degree Fahrenheit which is different than standard reference conditions used in most aircraft testing. In the field of aeronautics, the International Standard Atmosphere (ISA) is usually used as the standard ambient conditions, and uses a temperature as 59 degrees Fahrenheit. All the performance information in the flight manuals (carried aboard each airplane) are given for ISA conditions. The proposed changes to Appendix G simplifies the data reduction by uniting the performance and acoustic reference conditions for propeller-driven small airplanes at 59 degrees Fahrenheit and 70 percent relative humidity. This section was adopted as proposed.

Comments on Section G36.201(c)

The only comment regarding this section did not object to the proposed change; the revision to paragraph (c) is adopted as proposed.

Comments on Section G36.201(d)

Aeromod's comment on proposed paragraph (d)(1) is as follows:

> The proposed change to the equation for atmospheric absorption is indeed more accurate. However, if the comments provided for section 36.201(b) above are adopted, the 0.7 constant in the equation would need to be changed to 0.9, which is the proper constant for a 77°F/70%RH reference day. The equation currently published in FAR 36, Appendix G is incorrect for the current acoustic reference day, and has been for more than 10 years. The current published equation, using a 0.7 constant, actually corrects to a 59°F/70%RH, resulting in a 0.2 dB error which is detrimental to the applicant.

Aeromod also states that it has no objection to the proposed change in paragraph (d)(4), but notes that "the option to determine the value of K_3 experimentally, as is allowed for tip Mach corrections, is a welcome addition to the rule."

FAA Response

Aeromod's comment was based on the FAA incorporating Aeromod's suggested change to § G36.201(b). The FAA is not incorporating Aeromod's change to G36.201(b); accordingly, the change to paragraph (d) is not accepted, and the equation in § 36.201(d)(1) is adopted as proposed.

Comment on Section G36.201(d)

The French DGAC comments that in the equation in paragraph (d)(1), the figure "0.7" should be replaced with "0.6" to harmonize with ICAO Annex 16, Chapter 10 and JAR 36 so that the equation reads "Delta (m)=(Ht alpha-0.6 Hr)/1000.

FAA Response

The FAA disagrees with the DGAC. The FAA uses English Units version of the SAE ARP 866A, which has the absorption value for 59 degrees Fahrenheit, 77 percent relative humidity as 0.7. The DGAC first derived the equation for absorption in metric units then converted the results into English Units. The DGAC derivation and conversion processes introduce an error of 0.1 in the absorption correction equation. The equation in paragraph (d) is adopted as proposed.

Section G36.301 Aircraft Noise Limits

Current § G36.301(b) states that for aircraft weights up to 1,320 pounds (600 kg) the noise level must not exceed 73 dB(A); for weights greater than 1,320 pounds, the noise limit increases at the rate of 1 dB /165 pounds up to 85 dB(A) at 3,300 pounds, after which the noise level remains constant at 85 dB(A) up to and including aircraft weight of 19,000 pounds.

As previously discussed, considerations of microphone location, configuration, and resulting noise limits are interrelated. Since the proposed changes to the noise measurement procedures of § G36.107(a) would result in increases in the measured noise levels of about 3 dB(A), the FAA proposed to increase the limits in § 36.301(b) from 73 dB(A) to 76 dB(A) and from 85 dB(A) to 88 dB(A) to account for these different measurement procedures, but without changing the stringency of the current rule.

In addition to the dB(A) increases discussed, the FAA proposed a change to the interpolation requirement of § G36.301(b). For airplane weights greater than 1,320 pounds, the allowable

dB(A) would increase with the logarithm of airplane weight at the rate of 9.83 dB(A) per doubling of weight until the limit of 88 dB(A) is reached * * *," rather than at the rate of 1 dB/165 pounds up to 85 dB(A) at 3,300 pounds, as under the current rule. The new logarithmic interpolation between the low and high takeoff weights was adopted from the Annex 16, Volume I Chapter 10. The working group analyzed the available data obtained by use of a ground microphone, and decided to adopt the logarithmic interpolation that is between low and high takeoff weights.

Comments

The only comment regarding this section did not object to the proposed change; § G36.301(b) is adopted as proposed.

Paperwork Reduction Act

In accordance with the Paperwork Reduction Act of 1995 (44 U.S.C. § 3507(d)), the FAA has determined that there are no requirements for information collection associated with this final rule.

Compatibility with ICAO Standards

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA's policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. For this final rule, the FAA has reviewed part 36 Appendix G and ICAO Annex 16 Volume 1, Chapter 10. The review showed that the following two items were left unharmonized: (1) For fixed pitch type propellers, § G36.201 specifies a simplified data correction procedure if the engine test power is within 5% of the reference power. Annex 16 does not have a corresponding simplification. (2) The use of maximum continuous installed power during the second segment of the flight path is allowed under § G36.111. The power definition in Annex 16 for the second segment is defined as maximum power in Chapter 10 section 10.5.2 of Annex 16. The maximum installed power is typically lower than the maximum power and applicable only to old technology engines. The above two unharmonized items only affect airplanes with old technology engines, which are diminishing in number every year. The old airplanes equipped with old technology engines are not required to undergo noise certification or already are noise certificated. On very rare occasions, these airplanes may be required to perform a new noise test, but are not significant enough to be considered as harmonization issues.

Regulatory Evaluation Summary

Economic Summary

Four principal requirements pertain to the economic impacts of changes to the Federal Regulations. First, Executive Order 12866 directs Federal agencies to promulgate new regulations or modify an existing regulations after consideration of the expected benefits to society and the expected costs. The order also requires Federal agencies to assess whether a final rule is considered a "significant regulatory action." Second, the Regulatory Flexibility Act of 1980 requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Office of Management and Budget directs agencies to assess the effect of regulatory changes on international trade. Finally, Public Law 104–4, Department of Transportation Appropriations Act (November 15, 1995), requires Federal agencies to assess the impact of any Federal mandates on State, Local, Tribal governments, and the private sector.

Executive Order 12866 and DOT's Policies and Procedures

Under Executive Order 12866, each Federal agency shall assess both the costs and the benefits of final regulations while recognizing that some costs and benefits are difficult to quantify. A final rule is promulgated only upon a reasoned determination that the benefits of the final rule justify its costs.

The benefit of the final rule is that it will harmonize the U.S. noise certification regulations with the European Joint Aviation Requirements for propeller-driven small airplanes. The changes will provide nearly uniform noise certification standards for airplanes certificated in the United States and by the European Joint Aviation Authorities (JAA). This is expected to reduce the number of noise tests that need to be conducted. The costs to implement this rulemaking are negligible, if any. There are no additional costs imposed by this final rule.

The final rule will also not be considered a significant regulatory action because (1) it does not have an annual effect of $100 million or more or adversely affect in a material way the economy or a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, Local or Tribal governments or communities; (2) it does not create a serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) it does not materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients; and (4) it does not raise novel legal or policy issues arising out of legal mandates, the President's priorities or principles set forth in the Executive Order. Because the final rule is not considered significant under these criteria, it was not reviewed by the Office of Management and Budget (OMB) for consistency with applicable law, the President's priorities, and the principles set forth in this Executive Order nor was OMB involved in deconflicting this final rule with ones from other agencies.

Final Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (the Act) establishes "as principle of regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statues, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation." To achieve that and to explain the rationale for their actions, the Act covers a wide-range of small entities, including small businesses, not-for-profit organizations and small governmental jurisdictions.

Agencies must perform a review to determine whether a final rule will have a significant economic impact on a substantial number of small entities. If the determination is that it will, the agency must prepare a Regulatory Flexibility Analysis (RFA) as described in the Act.

However, if an agency determines that a final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 Act provides that the head of the agency may so certify and an RFA is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

The FAA conducted the required review of this final rule and determined that the cost imposed by this rule will be negligible and that it will not have a significant economic impact on a substantial number of small entities. Accordingly, pursuant to the Regulatory Flexibility Act, 5 U.S.C. 605 (b), the FAA certifies that this rule will not have a significant economic impact on a substantial number of small entities

because the costs imposed by this rule will be negligible.

Final International Trade Impact Assessment

The FAA has determined that the final rule will promote the sale of foreign products and services in the United States and the sale of U.S. products and services in foreign countries. This determination is based on the FAA's determination that the rule harmonizes U.S. standards with the JAR's standards for noise certification for propeller-driven small airplanes.

Federalism Implications

The regulations herein do not have a substantial direct effect on the States, on the relationship between national Government and the States, or on the distribution of power and responsibilities among various levels of government. Thus, in accordance with Executive Order 12612, it is determined that this rule does not have sufficient federalism implications to warrant the preparation of a federalism assessment.

Final Unfunded Mandates Assessment

Title II of the Unfunded Mandates Reform Act of 1995 (the Reform Act) enacted as Pub. L. 104–4 on March 22, 1995, requires each Federal agency, to the extent permitted by law, to prepare a written assessment of the effects of any Federal mandate in a final agency rule that may result in the expenditure by State, Local, and Tribal governments, in the aggregate, or by the private sector, of $100 million or more (adjusted annually for inflation) in any one year.

Section 204(a) of the Reform Act, 2 U.S.C. 1534(a), requires the Federal agency to develop an effective process to permit timely input by elected officers (or their designees) of State, Local, and Tribal governments on a final "significant intergovernmental mandate." A "significant intergovernmental mandate" under the Reform Act is any provision in a Federal agency regulation that will impose an enforceable duty upon State, Local, and Tribal governments, in the aggregate, of $100 million (adjusted annually for inflation) in any one year.

Section 203 of the Reform Act, 2 U.S.C. 1533, which supplements section 204(a), provides that before establishing any regulatory requirements that might significantly or uniquely affect small governments, the agency shall have developed a plan that, among other things, provides for notice to potentially affected small governments, if any, and for a meaningful and timely opportunity to provide input in the development of regulatory proposals.

This rule does not contain a Federal intergovernmental or private sector mandate that exceeds $100 million a year, therefore the requirements of the Reform Act do not apply.

Environmental Analysis

FAA Order 1050.1D defines FAA actions that may be categorically excluded from preparation of a National Environmental Policy Act (NEPA) environmental assessment (EA) or environmental impact statement (EIS). In accordance with FAA Order 1050.1D, appendix 4, paragraph 4(j), this rulemaking action qualifies for a categorical exclusion.

Energy Impact

The energy impact of the notice has been assessed in accordance with the Energy Policy and Conservation Act (EPCA) Pub. L. 94–163, as amended (43 U.S.C. 6362) and FAA Order 1053.1. It has been determined that the final rule is not a major regulatory action under the provisions of the EPCA.

List of Subjects in 14 CFR Part 36

Agriculture, Aircraft, Noise Control.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends part 36 of Title 14, Code of Federal Regulations as follows:

PART 36—NOISE STANDARDS: AIRCRAFT TYPE AND AIRWORTHINESS CERTIFICATION

1. The authority citation for part 36 continues to read as follows:

Authority: 42 U.S.C. 4321 *et seq.*; 49 U.S.C. 106(g), 40113, 44701–44702, 44704, 44715; sec. 305, Pub. L. 96–193, 94 Stat. 50, 57; E.O. 11514, 35 FR 4247, 3 CFR, 1966–1970 Comp., p. 902.

2. Appendix G of part 36 is amended by revising sections G36.107(a), G36.201(b), including Figure G1, G36.201(c), G36.201(d)(1), G36.201(d)(4), and G36.301(b), including Figure G2, to read as follows:

Appendix G to Part 36—Takeoff Noise Requirements for Propeller-Driven Small Airplane and Propeller-Driven Commuter Category Airplane Certification Tests on or After December 22, 1988

* * * * *

Sec. G36.107 Noise Measurement Procedures

(a) The microphone must be a pressure type, 12.7 mm in diameter, with a protective grid, mounted in an inverted position such that the microphone diaphragm is 7 mm above and parallel to a white-painted metal circular plate. This white-painted metal plate shall be 40 cm in diameter and at least 2.5 mm thick. The plate shall be placed horizontally and flush with the surrounding ground surface with no cavities below the plate. The microphone must be located three-quarters of the distance from the center to the back edge of the plate along a radius normal to the line of flight of the test airplane.

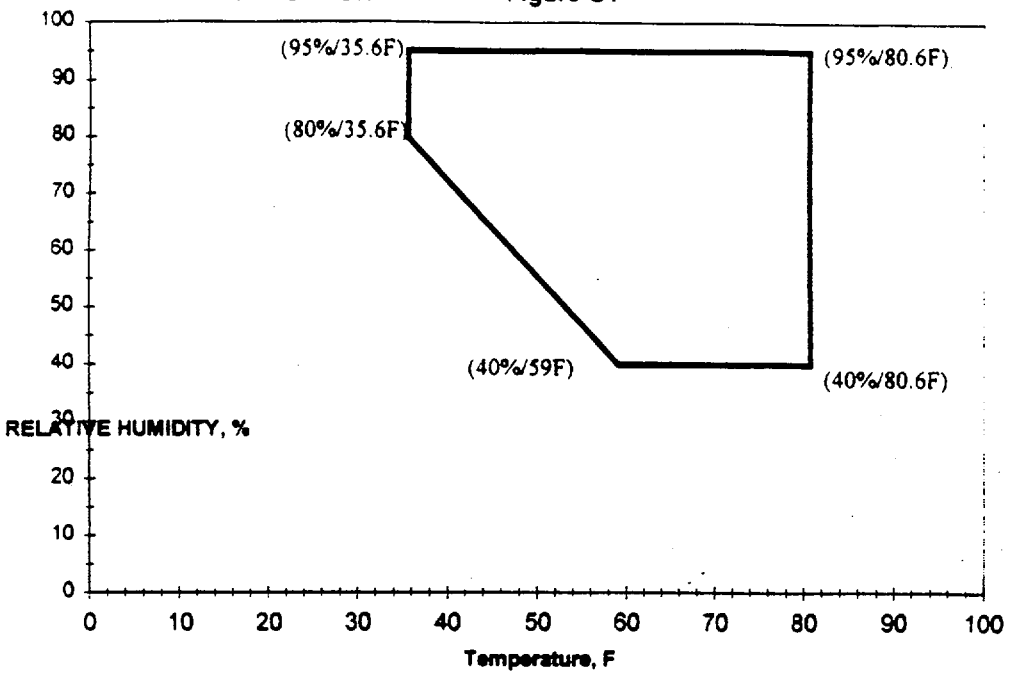
* * * * *

Sec. G36.201 Corrections to Test Results

* * * * *

(b) Atmospheric absorption correction is required for noise data obtained when the test conditions are outside those specified in Figure G1. Noise data outside the applicable range must be corrected to 59 F and 70 percent relative humidity by an FAA approved method.

MEASUREMENT WINDOW FOR NO ABSORPTION CORRECTION **Figure G1**



(c) Helical tip Mach number and power corrections must be made as follows:

(1) Corrections for helical tip Mach number and power corrections must be made if—

(i) The propeller is a variable pitch type; or

(ii) The propeller is a fixed pitch type and the test power is not within 5 percent of the reference power.

(2) No corrections for helical tip Mach number variation need to be made if the propeller helical tip Mach number is:

(i) At or below 0.70 and the test helical tip Mach number is within 0.014 of the reference helical tip Mach number.

(ii) Above 0.70 and at or below 0.80 and the test helical tip Mach number is within 0.007 of the reference helical tip Mach number.

(iii) Above 0.80 and the test helical tip Mach number is within 0.005 of the reference helical tip Mach number. For mechanical tachometers, if the helical tip Mach number is above 0.8 and the test helical tip Mach number is within 0.008 of the reference helical tip Mach number.

(d) * * *

(1) Measured sound levels must be corrected from test day meteorological conditions to reference conditions by adding an increment equal to

Delta (M) = (H_T α—0.7 H_R) /1000

where H_T is the height in feet under test conditions, H_R is the height in feet under reference conditions when the aircraft is directly over the noise measurement point and α is the rate of absorption for the test day conditions at 500 Hz as specified in SAE ARP 866A, entitled "Standard Values of Atmospheric Absorption as a function of Temperature and Humidity for use in Evaluating Aircraft Flyover Noise" as incorporated by reference under § 36.6.

* * * * *

(4) Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to

Delta(3) = K_3 log (P_R/P_T)

where P_R and P_T are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test airplane. In the absence of flight test data and at the discretion of the Administrator, a value of K_3 = 17 may be used.

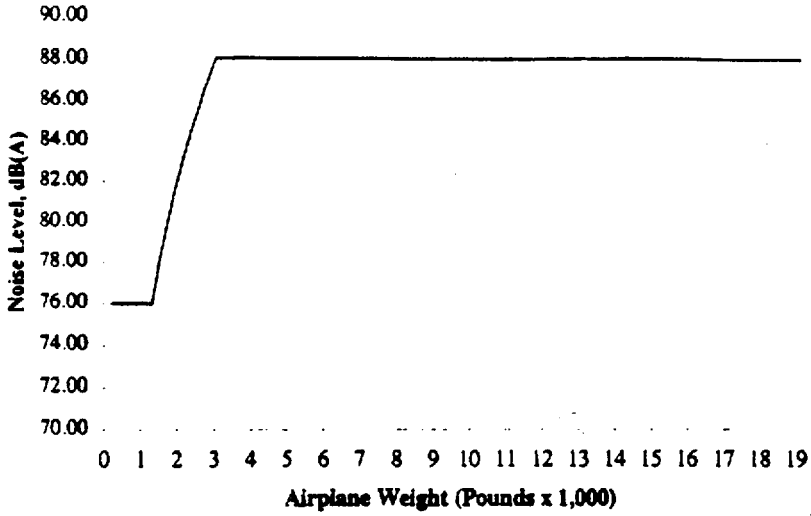
* * * * *

Sec. G36.301 Aircraft Noise Limits

* * * * *

(b) The noise level must not exceed 76 dB (A) up to and including aircraft weights of 1,320 pounds (600 kg). For aircraft weights greater than 1,320 pounds, the limit increases from that point with the logarithm of airplane weight at the rate of 9.83 dB (A) per doubling of weight, until the limit of 88 dB (A) is reached, after which the limit is constant up to and including 19,000 pounds (8,618 kg). Figure G2 shows noise level limits vs airplane weight.

NOISE LEVELS vs AIRPLANE WEIGHT
FIGURE G2



Issued in Washington, DC, on October 7, 1999.

Jane F. Garvey,

Administrator.

[FR Doc. 99–26704 Filed 10–12–99; 8:45 am]

BILLING CODE 4910–13–P

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of establishment of FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes.

SUMMARY: Notice is given of the establishment of a FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes for the FAA Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC on noise certification issues.

FOR FURTHER INFORMATION CONTACT: Mr. Paul R. Dykeman, Assistant Executive Director for Noise Certification, Deputy Director, Office of Environment and Energy (AEE-2), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-3577; FAX: (202) 267-5594.

SUPPLEMENTARY INFORMATION:

The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993). One area of the ARAC deals with noise certification issues. These issues involve the harmonization of part 36 of the Federal Aviation Regulations (14 CFR part 36) with Joint Aviation Requirements (JAR) part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will forward recommendations to the ARAC, which will determine whether to forward them to the FAA.

Specifically, the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is charged with reviewing the applicable provisions of subparts A and F, and appendices F and G of the 14 CFR part 36 and harmonizing them with the corresponding applicable provisions of JAR 36.

ARAC should consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. ARAC should also consider recommending a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and FAR 36.

If the ARAC determines that a Notice of Proposed Rulemaking (NPRM), an Advisory Circular (AC), or both would be appropriate, those documents are to be submitted, in the format prescribed, to the FAA. The Working Group should make recommendations to the ARAC in the following manner.

Reports:

(a) Recommend a work plan for completion of the task and subtasks, including the rationale supporting the plan, for consideration at the meeting of the ARAC to consider noise certification issues held following publication of this notice;

(b) Give a detailed conceptual presentation on the proposed recommendation to the ARAC before proceeding with the work stated in item (c) below;

(c) If considered appropriate, develop NPRM(s) proposing the revised rules for aircraft noise certification, a supporting economic and other required analyses, advisory and guidance material, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition; and

(d) Give a status report on the task at each meeting of the ARAC held to consider noise certification issues.

The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will be comprised of experts from those organizations having an interest in the tasks assigned. A Working Group member need not necessarily be a representative of one of the organizations of the ARAC. Individuals who have expertise in the subject matter and wish to become a member of the Working Group should write the person listed under the caption, "FOR FURTHER INFORMATION CONTACT," expressing that desire, describing their interest in the task, and the expertise they would bring to the working group. The request will be reviewed by the ARAC Assistant Chair for Noise Certification and the Chair of the Working Group, and the individual will be advised if the request can be granted.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary and in the public interest, in connection with the performance of duties of the FAA. Meetings of the ARAC to consider noise certification issues will be open to the public, except as authorized by Section 10(d) of the Federal Advisory Committee Act. Meetings of the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of Working Group meetings will be made.

Issued in Washington, DC, on April 25, 1994.

Paul R. Dykeman,

Assistant Executive Director for Noise Certification,

Aviation Rulemaking Advisory Committee

U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

SEP 20 1995

Mr. David Hilton
Gulfstream Aerospace Corporation
P.O. Box 2206, M/S D-04
Savannah, GA 31402-2206

Dear Mr. Hilton:

The Federal Aviation Administration (FAA) tasked the Aviation Rulemaking Advisory Committee (ARAC) with the following:

> Review all applicable provisions of subparts A and F, and appendices F and G of the 14 Code of Federal Regulations (CFR) part 36 and harmonize them with the corresponding applicable provisions of the Joint Aviation Requirements (JAR) 36; review all applicable provisions of subparts A, B, and D, and appendices A, B, and C of the 14 CFR part 36 and harmonize them with the corresponding applicable provision of JAR 36; and review the applicable provisions of subparts A and H, and appendices H and J of the 14 CFR part 36 and harmonize them with the corresponding applicable provisions of JAR 36.

In conducting these reviews the FAA requested that ARAC consider:

> Current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals; developing a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and Federal Aviation Regulations 36.

The ARAC tasked three working groups to review and develop recommendations with respect to these tasks.

After further consideration, the FAA agrees with your position that each of the three tasks should include a review of the acoustical change provisions of the

14 CFR part 21, subpart D. Any recommendation on noise issues should consider harmonization with respect to corresponding JAR to the extent practicable. The FAA recommends that any proposed recommendations be coordinated among the other working groups to ensure consistency in proposed regulatory language, advisory and guidance material, and any other collateral documents developed by these working groups.

The FAA will publish revised task statements in the Federal Register.

Sincerely,

for Anthony J. Broderick
Associate Administrator for
Regulation and Certification

U.S. Department
of Transportation
**Federal Aviation
Administration**

800 Independence Ave., S.W.
Washington, D.C. 20591

AUG 17 1998

Mr. David A. Hilton
Aviation Rulemaking Advisory Committee
Noise Certification Issues
P.O. Box 2206 M/S D04
Savannah, GA 31402-2206

Dear Mr. Hilton:

Thank you for your July 15 letter forwarding the recommendation of the Aviation Rulemaking Advisory Committee (ARAC). The recommendation includes a notice of proposed rulemaking (NPRM) proposing changes to harmonize the U.S. noise certification regulations and the European Joint Aviation Requirements (JAR) for propeller-driven small airplanes.

The complete rulemaking package will be reviewed and coordinated within the Federal Aviation Administration (FAA) and, if appropriate, the Offices of the Secretary of Transportation and Management and Budget. The FAA will publish the NPRM for public comment as soon as the coordination process is complete. We will make every effort to handle this recommendation expeditiously.

I would like to thank the aviation community for its commitment to ARAC and its expenditure of resources in the development of this recommendation. More specifically, I would like to thank the members of the Federal Aviation Regulations/JAR 36 Harmonization Working Group for Propeller Driven Small Airplanes, for their commitment to the ARAC process and prompt action on this task.

Sincerely,

Guy S. Gardner
Associate Administrator for
Regulation and Certification

July 15, 1998

From: Aviation Rulemaking Advisory Committee (ARAC)
Assistant Chair for Noise Certification Issues

To: Associate Administrator for Regulation and Certification

Subject: Noise Certification Standards for Propeller-Driven Small Airplanes

I am pleased to report that the Propeller-Driven Small Airplanes working group presented their proposed Notice of Proposed Rulemaking (NPRM) for 14 CFR Part 36 to the ARAC Noise Certification Issues Group on July 15, 1998. This ARAC Issue Group accepted this NPRM as written, and I am forwarding this NPRM to the FAA for review, concurrence and publication.

This NPRM only affects noise certification standards for propeller-driven small airplanes.

D. A. Hilton

Attachment

Copy to: Chairman, Aviation Rulemaking Advisory Committee
Director of Rulemaking, ARM-1
Assistant Executive Director for Noise Certification Issues

Aviation Rulemaking Advisory Committee; Noise Certification Issues—Revised Task

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of revised task assignment for the Aviation Rulemaking Advisory Committee.

SUMMARY: Notice is given of a change in the task assigned to and accepted by the Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC.

FOR FURTHER INFORMATION CONTACT: Mr. Paul R. Dykeman, Assistant Executive Director for Noise Certification, Deputy Director, Office of Environment and Energy (AEE–2), 800 Independence Avenue, SW., Washington, DC 20591, Telephone (20) 267–3577; FAX: (202) 267–5594.

SUPPLEMENTARY INFORMATION: The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993) to provide advice and recommendations to the FAA Administrator, through the Associate Administrator for Regulation and Certification, on the full range of the FAA's rulemaking activities with respect to aviation-related issues. This includes obtaining advice and recommendations on the FAA's commitment to harmonize its Federal Aviation Regulations (FAR) and practices with its trading partners in Europe and Canada.

One area of the ARAC deals with noise certification issues. These issues involve the harmonization of part 36 of the Federal Aviation Regulations (14 CFR part 36) with Joint Aviation Requirements (JAR) part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will forward recommendations to the ARAC, which will determine whether to forward them to the FAA.

The Revised Task

This notice is to inform the public that the FAA has revised a task previously assigned to ARAC. The revised task has been accepted by ARAC. The FAA has asked ARAC to provide advice and recommendation on the following revised task:

Specifically, the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is charged with reviewing the applicable provisions of subparts A and F and appendices F and G of the 14 CFR part 36 and harmonizing them with the corresponding applicable provisions of JAR 36. The review should also include a review of the acoustical change provisions of the 14 CFR 21 subpart D. Any recommendation on noise issues should consider harmonization with respect to corresponding JAR to the extent practicable. The FAA recommends that any proposed recommendations be coordinated among other working groups to ensure consistency in proposed regulatory language, advisory and guidance material, and any other collateral documents developed by the working groups.

ARAC should consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. ARAC should also consider recommending a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and FAR 36.

ARAC Acceptance of Revised Task

ARAC has accepted the revised task and has chosen to assign it to the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes. The working group will serve as staff to ARAC to assist ARAC in the analysis of the assigned task. Working group recommendations must be reviewed and approved by ARAC. If ARAC accepts the working group's recommendations, it forwards them to the FAA as ARAC recommendations.

Working Group Activities

The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is expected to comply with the procedures adopted by ARAC. As part of the procedures, the working group is expected to:

(a) Recommend a work plans for completion of the task and subtasks, including the rationale supporting the plan, for consideration at the meeting of the ARAC to consider noise certification issues held following publication of this notice;

(b) Give a detailed conceptual presentation on the proposed recommendation to the ARAC before proceeding with the work stated in item (c) below;

(c) If considered appropriate, develop NPRM(s) proposing the revised rules for aircraft noise certification, a supporting economic and other required analyses, advisory and guidance materials, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition; and

(d) Give a status report on the task at each meeting of the ARAC held to consider noise certification issues.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary and in the public interest, in connection with the performance of duties of the FAA. Meetings of the ARAC to consider noise certification issues will be open to the public, except as authorized by Section 10(d) of the Federal Advisory Committee Act. Meetings of the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will not be open to the public, except to the extent that individuals with an interest and expertise are selected to participate. No public announcement of Working Group meetings will be made.

Issed in Washington, DC, on October 10, 1995.

Paul R. Dykeman,

Assistant Executive Director for Noise Certification, Aviation Rulemaking Advisory Committee.

[FR Doc. 95–25679 Filed 10–16–95; 8:45 am]

BILLING CODE 4910–13–M

[4910-13]

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Aviation Rulemaking Advisory Committee; Noise Certification Issues - Revised Task

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of revised task assignment for the Aviation Rulemaking Advisory Committee.

SUMMARY: Notice is given of a change in the task assigned to and accepted by the Aviation Rulemaking Advisory Committee (ARAC). This notice informs the public of the activities of the ARAC.

FOR FURTHER INFORMATION CONTACT: Mr. Paul R. Dykeman, Assistant Executive Director for Noise Certification, Deputy Director, Office of Environment and Energy (AEE-2), 800 Independence Avenue, SW., Washington, DC 20591, Telephone: (202) 267-3577; FAX: (202) 267-5594.

SUPPLEMENTARY INFORMATION:

The Federal Aviation Administration (FAA) established an Aviation Rulemaking Advisory Committee (ARAC) (56 FR 2190, January 22, 1991; and 58 FR 9230, February 19, 1993) to provide advice and recommendations to the FAA Administrator, through the Associate Administrator for Regulation and Certification, on the full range of the FAA's rulemaking activities with respect to aviation-related issues. This includes obtaining advice and recommendations on the FAA's commitment to harmonize its Federal Aviation Regulations (FAR) and practices with its trading partners in Europe and Canada.

One area of the ARAC deals with noise certification issues. These issues involve the harmonization of part 36 of the Federal Aviation Regulations (14 CFR part 36) with Joint Aviation Requirements (JAR) part 36, their associated guidance material including equivalent procedures, and the interpretation of the regulations. The FAR/JAR

Harmonization Working Group for Propeller-Driven Small Airplanes will forward recommendations to the ARAC, which will determine whether to forward them to the FAA.

The Revised Task

This notice is to inform the public that the FAA has revised a task previously assigned to ARAC. The revised task has been accepted by ARAC. The FAA has asked ARAC to provide advice and recommendation on the following revised task:

Specifically, the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is charged with reviewing the applicable provisions of subparts A and F and appendices F and G of the 14 CFR part 36 and harmonizing them with the corresponding applicable provisions of JAR 36. The review should also include a review of the acoustical change provisions of the 14 CFR 21 subpart D. Any recommendation on noise issues should consider harmonization with respect to corresponding JAR to the extent practicable. The FAA recommends that any proposed recommendations be coordinated among other working groups to ensure consistency in proposed regulatory language, advisory and guidance material, and any other collateral documents developed by the working groups.

ARAC should consider the current international standards and recommended practices, as issued under the International Civil Aviation Organization (ICAO), Annex 16, Volume 1, and its associated Technical Manual, as the basis for development of these harmonization proposals. ARAC should also consider recommending a process whereby subsequent ICAO Annex 16 changes are properly incorporated into JAR and FAR 36.

ARAC Acceptance of Revised Task

ARAC has accepted the revised task and has chosen to assign it to the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes. The working group will serve as staff to ARAC to assist ARAC in the analysis of the assigned task. Working group recommendations must be reviewed and approved by ARAC. If ARAC accepts the

working group's recommendations, it forwards them to the FAA as ARAC recommendations.

Working Group Activities

The FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes is expected to comply with the procedures adopted by ARAC. As part of the procedures, the working group is expected to:

(a) Recommend a work plan for completion of the task and subtasks, including the rationale supporting the plan, for consideration at the meeting of the ARAC to consider noise certification issues held following publication of this notice;

(b) Give a detailed conceptual presentation on the proposed recommendation to the ARAC before proceeding with the work stated in item (c) below;

(c) If considered appropriate, develop NPRM(s) proposing the revised rules for aircraft noise certification, a supporting economic and other required analyses, advisory and guidance material, and any other collateral documents the Working Group determines to be needed. Present these recommendations to the ARAC for further consideration and disposition; and

(d) Give a status report on the task at each meeting of the ARAC held to consider noise certification issues.

The Secretary of Transportation has determined that the formation and use of the ARAC are necessary and in the public interest, in connection with the performance of duties of the FAA. Meetings of the ARAC to consider noise certification issues will be open to the public, except as authorized by Section 10(d) of the Federal Advisory Committee Act. Meetings of the FAR/JAR Harmonization Working Group for Propeller-Driven Small Airplanes will not be open to the public, except to the extent that individuals

with an interest and expertise are selected to participate. No public announcement of Working Group meetings will be made.

Issued in Washington, DC, on OCT 10 1995

Paul R. Dykeman,

Assistant Executive Director for Noise Certification,
Aviation Rulemaking Advisory Committee

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Noise

Concept Paper

FROM MEHMET
x77703

Robert L Howes, US Co-Chair ; GONZO@Southwind.net
Robert Wilson, European Co-Chair

3rd Draft
January 1996

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Table of Contents

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

1. INTRODUCTION

This document summarizes the work and recommendations to date of the ARAC Harmonization Working Group for Light Propeller Driven Aircraft (HWGLPDA) Noise. This working group was established, staffed and held its first meeting in Ottawa Canada, 15-16 September 1994. A work plan was established and is repeated here as:

1.1 The harmonization working group will identify a work program and ascribe priorities to individual tasks in order to accomplish the following:

> "Identify and confirm the differences between the Noise Certification Requirements of the American Federal Aviation Regulations and European Joint Airworthiness Requirements as applicable to Propeller Driven Airplanes and to draft proposed Notices of Proposed Rulemaking to FAR's and/or Notices of Proposed Amendment to JAR's that will accomplish harmonization of Part 36 Appendix G of the Federal Aviation Regulations (14 CFR Part 36) with Joint Aviation Requirements, JAR-36, Section 1, Sub Section C. In addition proposed changes aimed at achieving harmonization of guidance and interpretative material contained in the FAR Advisory Circular AC36-4B, FAA Policy Letters and JAR 36 Section 2 will be undertaken."

1.2 Work program output will be documents outlining proposals for changes to noise certification requirements and recommendations for guidance material that will result in harmonization between the subject bodies of regulation as well as their interpretation and implementation.

1.3 Proposals for changes to the noise certification requirements, guidance and interpretive material will be submitted to the JAR 36 working group and ARAC for approval and subsequent submission to the FAA and JAA for executive review.

1.4 Progress on the work of the harmonization working group will be reported periodically to the ARAC and JAR 36 working group.

A second meeting was held in Gatwick, UK 21-22 February, 1995. A third meeting was held 6-7 July, 1995 in Wichita, Kansas, USA. A fourth, ad hoc working meeting was held 14-15 November, 1995 in Frankfurt Germany.

All of the activity of this working group is summarized in this document. Appendix A contains a table that summarizes all of the items of regulation requiring harmonization. Appendix B contains a set of HWGLPDA Technical Position Papers (LPDA-TPP-xxx) documenting the recommendations for harmonization and a discussion of the reasons for harmonization in each case.

Appendix C contains the minutes of each of four meetings held so far. Appendix D repeats the committee membership list. Appendix E contains co-ordination documents.

The following sections are organized to present first the harmonization activity for actual items of regulation. Second, activity required for harmonization of interpretive material is discussed. Finally a section is included describing the process intended to co-ordinate the harmonization recommendations.

2. HARMONIZATION OF REGULATIONS

Reference Appendix A, table of regulation differences.

2.1 Item 1: Applicability, LPDA-TPP-012

Harmonization is not recommended. The applicability dates have all lapsed.

2.2 Item 2: Weight Limit, LPDA-TPP-003

Referenced TPP highlights that weight differences in the noise certification regulations are arbitrary and inconsistent. As such they could impose an economic burden for manufacturers producing aeroplanes over the limit in one body of regulation and under the limit in the other. Therefore harmonization is recommended and outlined. The change to harmonize affects ICAO Annex 16 and JAR 36. Co-ordination of this change has been started. See Appendix E for co-ordination documents.

2.3 **Items 3 and 12: Microphone Height and Noise Limits, LPDA-TPP-006**

It is recommended in referenced TPP that FAA adopt JAR/ICAO microphone location and configuration along with associated limits. Change will enhance the public good because it will provide a favorable economic approach to aid investigation of stringency requirements.

2.4 **Items 4 and 5: Tape Calibration and Quality, LPDA-TPP-007**

Harmonization not recommended because the differences between the requirements are small and the economic impact on test procedures is negligible.

2.5 **Item 7: Pre/De-emphasis Recording, LPDA-TPP-012**

Harmonization not recommended because applicable instrument standards are in the process of being revising.

2.6 **Item 6: Meteorological Data, LPDA-TPP-005**

Change to ICAO/JAR has been recommended. Recommended change will allow for increased flexibility in test procedures and will enhance the economic feasibility of testing. Co-ordination of this change has been started. See Appendix E for co-ordination documents.

2.7 **Item 8: No Absorption Correction Window, LPDA-TPP-002**

Change to FAR is recommended. Impact is economic since absence of harmonization could theoretically require two separate tests.

2.8 **Item 9: Adjustments, Absorption Outside Test Window, LPDA-TPP-001**

Change to FAR is recommended. Impact is economic since absence of harmonization could theoretically result in compliance with one body of regulation and not the other. This could require repeat testing.

2.9 **Item 10: Power Adjustments, LPDA-TPP-004**

Recommended harmonization will require an ~~addition~~ change to JAR/ICAO FAR Impact is economic and harmonization will reduce economic burden of testing and enhance the public good because power settings will be clarified and defined. No co-ordination has been initiated.

2.10 **Item 11: Reference Noise Level, LPDA-TPP-012**

Harmonization not recommended. The differences are not significant.

2.11 **Item 13: Power Variance, LPDA-TPP-008**

Recommended harmonization will require a change to JAR. This will result in increased testing flexibility. Impact is economic.

2.12 **Item 14: Power Definition, LPDA-TPP-009**

Recommended harmonization will require a change to JAR/ICAO. The result will enhance the public good because it will result in a consistent application of JAR/ICAO by removing a possible ambiguity in the definition of take-off power.

2.13 **Item 15: Helical Tip Mach No. Tolerance, LPDA-TPP-010**

Recommended Harmonization will require a change to FAR. Impact is economic because it will increase flexibility allowed in testing.

2.14 **Item 16: Sound Level Meter Settings, LPDA-TPP-011**

Harmonization not recommended as the difference in wording between the two requirements has a negligible impact on economic and test procedures.

Table 1: Summary of Harmonization Items

Item	Justification	Regulation Impact	
		FAR	JAR/ICAO
1. Applicability	LPDA-TPP-012	No Harmonization Recommended	
2. Weight Limit	LPDA-TPP-003		X
3. Microphone Height	LPDA-TPP-006	X	
4. Pseudo-random pink noise cal for recordings	LPDA-TPP-007	No Harmonization Recommended	
5. Tape Quality	LPDA-TPP-007	No Harmonization Recommended	
6. Meteorological Data	LPDA-TPP-005		X
7. Pre/de-emphasis Recording	LPDA-TPP-012	No Harmonization Recommended	
8. No absorption correction window	LPDA-TPP-002	X	
9. Adjustments, absorption outside test window	LPDA-TPP-001	X	
10. Power adjustments	LPDA-TPP-004	X	
11. Reference noise level	LPDA-TPP-012	No Harmonization Recommended	
12. Noise limits	LPDA-TPP-006	X	
13. Power variance	LPDA-TPP-008		X
14. Power Definition	LPDA-TPP-009		X
15. Helical Tip Mach No tolerance	LPDA-TPP-010	X	
16. Sound Level Meter Settings	LPDA-TPP-011	No Harmonization Recommended	

3. HARMONIZATION OF INTERPRETIVE MATERIAL

Work is underway to harmonize available interpretive and advisory material. Reference 1 Appendix G Handbook and reference 2 JAR 36, Section 2, Advisory Material Joint (including notes contained in Section 1) will be reviewed by the working group. Members are compiling some documentation of test experience. When these activities are complete a document entitled, "Harmonization of Interpretive and Advisory Material for Light Propeller Driven Aircraft Noise Certification", will be assembled and made available to applicable certification agencies as recommendations and examples of approved test procedures.

4. CO-ORDINATION OF RECOMMENDED CHANGES

4.1 Review of Concept by ARAC

This document is submitted to ARAC chairman for review by appropriate ARAC members. ARAC will review Technical Position Papers and working group minutes. Working group chairs will co-ordinate with ARAC and working group membership until body of work is in order. At this point ARAC will co-ordinate with the FAA. JAA supports this working group and its work plan.

4.2 Changes to FAR's

All of the changes recommended to the FAR's are outlined in Section 2 and summarized in Table 1. The Technical Position Papers (TPP) outlining the reasons for the changes are all contained in Appendix B. Meeting minutes are all contained in Appendix C. This document will be forwarded to the FAA by ARAC after its review. FAA will review proposed changes and have an opportunity to make comments. When this is complete and satisfactory, the working group will meet to finalize required NPRM's with any FAA support that has been co-ordinated by ARAC.

4.3 Changes to JAR's

JAR 36 is based on ICAO Annex 16. Therefore, changes recommended to JAR 36 are enabled through changes to ICAO Annex 16. Recommendations for change are instigated through the ICAO working group process. An additional process takes advantage of industry co-ordination with ICCAIA. Here, technical papers are submitted by ICCAIA into the ICAO forum. These processes have begun in some cases. Co-ordination documents are contained in Appendix E.

5. JAR 36, CHANGE IN REFERENCE SUB PARTS AND APPENDICES

The harmonization work done by this group and reported here was based on the best available regulatory material. However, the JAR 36 material was in the draft issue stages. The final version was released in November 1995.

During the draft issue stages of JAR 36, Sub Part C - Propeller Driven Aeroplanes not Exceeding 9000 Kg, reflected the standards of ICAO, Annex 16, Chapter 6 of Volume 1. Sub part D - Propeller Driven Aeroplanes not Exceeding 9000 Kg reflected the standards of ICAO Annex 16, Chapter 10 of Volume 1.

Similarly, Appendix 2 of the Drafts of JAR 36 applied to Sub Part C / Chapter 6 aeroplanes and Appendix 3, to Sub Part D / Chapter 10 aeroplanes.

However, at the first formal issue, the applicability of these sub parts and appendices has been changed to reflect the fact that ICAO Annex 16, Chapter 6 is now obsolete. The option for aeroplanes to comply with Chapter 6, rather than Chapter 10, expired on November 17, 1993.

There is, therefore, only one applicable Sub Part and one applicable Appendix in the first issue of JAR 36 and this reflects ICAO, Annex 16, Chapter 10 of volume 1.

The Sub Part for propeller driven aeroplanes not exceeding 9000 Kg is Sub Part C. The Appendix is Appendix 2.

Sub part D and Appendix 3 in the first issue now applies to helicopters.

All the work of the LPDA HWG has been based on draft issues of JAR 36, and all references in the Concept Paper and Technical Position Papers, apply to the draft issue standards.

For clarification, these changes are tablulated below.

Table 2: Comparison of applicable Sub Parts and Appendices between the drafts and first issue standards of JAR 36

	Draft Issues of JAR 36	First Issue of JAR 36
Application for C of A for the prototype accepted before November 17, 1988. (Chapter 6 of Annex 16, Vol 1).	Subpart C and Appendix 2.	No longer covered
Certificate of airworthiness for prototype or derived version accepted on or after November 17, 1988. (Chapter 10 of Annex 16, Vol 1) Compliance with Chapter 6 was optional until November 17, 1993.	Sub Part D and Appendix 3	Sub Part C and Appendix 2

References

1. "14 CFR Part 36 Appendix G Handbook", US Department of Transportation, Federal Aviation Administration, October 15, 1994.

2. Joint Aviation Requirements, "JAR-36 Aircraft Noise", 5th Draft, September 1995.

3. Code of Federal Regulations, Aeronautics and Space 14, Part 36, "Noise Standards: Aircraft Type and Airworthiness Certification", revised as of January 1, 1995.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Appendix A: Summary of Required Harmonization

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for Propeller Driven Light Aeroplanes

Item	Chapter 10/Appendix 6	Appendix G
1. Applicability	C of A application after 19th November 1988 (10.1.1). Failures can be tested to Chapter 6 until 17 November 1993(10.1.2).	Aeroplanes tested after 22nd December 1988 (Appendix G table). no provision.
2. Weight limit	up to 9,000 Kg maximum take-off weight (10.1.1).	8,640 Kg max take-off weight, (G36.301(b)).
3. Microphone height	7 mm above a ground plate (Appendix 6, 4.4.1).	4ft above ground level (G36.107(a))
4. Pseudo-random pink noise cal for recordings.	relative output of each 1/3 octave band not more than 0.2 dB (Appendix 6, 4.4.2).	not defined
5. Tape quality	Variation in 10 KHz band of 30 secs of calibration signal at beginning and end of type not greater than 0.75 dB (Appendix 6, 4.4.3).	not defined
6. Meteorological data	collected at 1.2m (Appendix 6, 2.2.2(b),(c))	collected between 1.2m and 10m (G36.101(b)(6))
7. Pre/de-emphasis recording	no equivalent	G36.105(d)
8. No absorption correction window	Appendix 6, figure 6-2	lower temperature is 35.6 deg F (2.5 deg C compared with 2 deg C in Annex 16) (Fig G1)
9. Adjustments, absorption outside test window.	d(M) = 0.01 (Ht*alpha-0.2*Hr) Appendix 6, 5.2.2.(a)	not specified, G36.201(a)(4)(b) or d(M) = (alpha - 0.7)*Ht/1000
10. Power adjustments	d3=K3*log(Pr/Pt) Appendix 6, 5.2.2(d)	d3=17log(Pr/Pt) G36.201(d)(4)
11. Reference noise level	Appendix 6, 5.2.2, (Lamax)Ref=(Lamax)test+d(M)+d1+d2+d3	G36.201
12. Noise limits	Chapter 10, 10.4, 76 dB(A) up to 600 Kg and increasing at 9.83 dB(A) per doubling of noise until the limit of 88 dB(A) is reached and is constant up to 9000 Kg.	G36.301
13. Power variance	no equivalent	36.201(c)(2) allows for 5% power variation for aircraft with fixed pitch propellers.
14. Power Definition	Chapter 10, 10.5.2 could be interpreted to allow the use of a power setting other than take-off power or max continuous during the 2nd phase of the take-off.	FAR G36.111(2)(iv) clearly defines the power setting required.
15. Helical Tip Mach no tolerance	Appendix 6, 5.2.2(c) defines conditions under which no helical tip mach no correction is required.	FAR G36.201(c)(3) does not allow any tolerance in helical tip mach no.
16. Definition of Meter Settings	Appendix 6, 3 & 4.3	FAR G36.105(a) defines sound level meter settings.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

ICAO Annex 16, Volume I and JAR 36 cross reference.

Item	ICAO Annex 16	JAR 36
1. Applicability	Chapter 10. 10.1.1 Chapter 10. 10.1.2	Sub Part D, JAR 36.300(a) Sub Part D, JAR 36.300(b)
2. Weight Limit	Chapter 10. 10.1.1	Sub Part D, JAR 36.300(a)
3. Microphone Height	Appendix 6; 4.4.1	Appendix 3; 4.4.1
4. Pseudo-Random pink noise cal for recording.	Appendix 6; 4.4.2	Appendix 3; 4.4.2
5. Tape Quality	Appendix 6; 4.4.3	Appendix 3; 4.4.3
6. Meterological Data	Appendix 6; 2.2.2(b),(c)	Appendix 3; 2.2.2(b),(c)
7. Pre/De-emphasis recording	No definition	No definition
8. No absorption correction window	Appendix 6; Fig 6-2	Appendix 3; Fig A3-2
9. Adjustments, absorption outside test window	Appendix 6; 5.2.2(a)	Appendix 3; 5.2.2(a)
10. Power Adjustments	Appendix 6; 5.2.2(d)	Appendix 3; 5.2.2(d)
11. Reference noise level	Appendix 6; 5.2.2	Appendix 3; 5.2.2
12. Noise limits	Chapter 10, 10.4	Sub Part D, JAR 36.330
13. Power variance	No definition	No definition
14. Power definition	Chapter 10, 10.5.2	Sub Part D, JAR 36.340(b)(2)
15. Helical tip mach no. tolerance	Appendix 6; 5.2.2(c)	Appendix 3; 5.2.2(c)
16. Definition of meter settings	Appendix 6; 3 & 4.3	Apendix 3; 3 & 4.3

Appendix B: Technical Position Papers

LPDA-TPP-001
Absorption Corrections
R L Howes
7/6/95

Applicable FAR: FAR 36, Appendix G, G36.201(d)(1)

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2

1. Recommendation

Adopt the absorption correction procedures outlined in JAR referenced above.

2. Background and Relevant Data

Both the JAR and FAR referenced above require correction for atmospheric absorption if test conditions are outside the limits specified. JAR 36, Section 1, Appendix 3, 5.2.2 defines this as:

$$\Delta(M) = 0.01(H_T\alpha\text{-}0.2H_R) \quad (1)$$

FAR 36, Appendix G, G36.201(d)(1) defines this correction as:

$$\Delta(M) = (\alpha\text{-}0.7)\frac{H_T}{1000} \quad (2)$$

3. Discussion

These calculations are based on a reference temperature of 15 deg C in the JAR case and 25 deg C in the FAR case.

The FAR method shown in equation (2) is based on a reference absorption coefficient that corresponds to a temperature other than the FAR reference temperature of 25 deg C.

Recommendation is made to adopt the JAR calculation including the 15 deg C reference temperature.

References -

1. Aerospace Recommended Practice, ARP 866A, prepared by SAE Committee A-21, Aircraft Noise measurement, Revised 3-15-75.

2. Joint Aviation Requirements, JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2.

3. Federal Aviation Requirements, FAR 36, Appendix G, G36.201(d)(1).

LPDA-TPP-002
Temperature/Humidity Test Windows
R L Howes and R Wilson

10/11/95

Applicable FAR: FAR 36, Appendix G, G36.201(b) and fig G1.

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2(a) and Fig A.3-2.

1. Recommendation

Adopt the test limits of JAR 36 referenced above.

2. Background and Relevant Data

These sections specify the temperature limits outside of which corrections to the measured data must be made. FAR 36 lower limit is 36.5 deg F (2.5 deg C) and JAR 36 lower limit is 35.6 deg F (2 deg C). To harmonize this it is recommended that the JAR limit of 35.6 deg F (2 deg C) which is consistent with ICAO wording, be adopted. Note also that all other limits shown in FAR 36, Figure G1 are consistent with the corresponding JAR limits.

LPDA-TPP-003

Harmonization Between the Maximum Take-off Weight of ICAO Annex 16 and the Airworthiness Regulations for Small Propeller Driven Aircraft of the American FAR and European JAR 23

R Wilson

March 1995

This Paper was formatted to meet the requirements for submission to the ICAO Committee on Aviation Environmental Protection Technical Issues Sub-group (Aeroplanes) and is attached.

The Paper was approved by the ICAO CAEP Working Group 1 at its meeting in Bonn in June 1995.

It was proposed for adoption into ICAO Annex 16 at CAEP 3 in Montreal in December 1995.

The proposal was accepted by CAEP 3.

ICAO COMMITTEE ON AVIATION ENVIRONMENTAL PROTECTION
TECHNICAL ISSUES SUB-GROUP (AEROPLANES)
EIGHTH MEETING, 14 -15 MARCH 1995
SEATTLE, USA

Harmonisation between the Maximum Take-off Weight of ICAO Annex 16 and the Airworthiness Regulations for Small Propeller Driven Aircraft of the American FAR 23 and the European JAR 23

(Presented by the UK Member)

SUMMARY

There is an inconsistency in the maximum take-off weight specified by the European (JAR 23) and American (FAR 23) Airworthiness Regulations for "Small Propeller Driven Aircraft" and the Noise Regulations of ICAO Annex 16.

The maximum take-off weight specified by the Airworthiness Regulations is consistent between JARs and FARs :-

- **JAR 23 specifies : ".....8618 Kg (19000 lb) or less."**

- **FAR 23 specifies : ".....19000 lb or less."** No Kilogram equivalent is listed.

ICAO Annex 16 specifies a maximum weight of 9000 Kg. No Pounds equivalent is listed but for reference, **9000Kg is equivalent to 19842 lb** using the Internationally agreed conversion factor of 0.45359237 lb to 1 Kg.

No argument, or justification has been found for there to be a difference in the maximum take-off weight permitted by Noise Regulations of ICAO Annex 16 and the Airworthiness Regulations of JAR 23 and FAR 23.

In the interests of harmonisation it is therefore recommended that ICAO Annex 16 be amended to change all references to 9000 Kg to 8618 Kg; to be consistent with the maximum take of weight specified by the Airworthiness Regulations of JAR 23 and FAR 23.

1. INTRODUCTION

As a result of work by the FAR/JAR Harmonisation Working Group for Propeller Driven Small Aircraft, inconsistencies were identified between the maximum take-off weight specified by the European (JAR 23) and American (FAR 23) Airworthiness Regulations and the maximum take-off weight specified by the Noise Regulations applicable to this class of aircraft: FAR 36 Appendix G and JAR 36 Sub Sections B and C. JAR 36 reflects ICAO Annex 16 Chapters 6 and 10 respectively. The maximum take-off weights listed by these documents in the revision standards applicable on 1st March 1995 are:-

- **ICAO Annex 16/JAR 36 : 9000 Kg.** No Pounds equivalent is quoted but this equals **19842 lb** at the internationally agreed conversion rate of 0.45359237 lb to 1 Kg.

- **FAR 36 : 19000 lb.** A Kilogram equivalent of 8640 Kg is listed, but using the above conversion this is slightly in error and should read **8618 Kg.**

The Airworthiness Regulations, JAR 23 and FAR 23, are consistent with regard to maximum take-off weight, except for the preferred prime units listed:-

- **JAR 23.1 lists : ".....8618Kg (19000 lb) or less."**

- **FAR 23.3(d) lists : ".....19000 lb or less."** There is no Kilogram equivalent listed.

During committee discussion of the FAR/JAR Harmonisation Working Group for Propeller Driven Small Aircraft it was agreed that not only was it desirable to achieve harmonisation between JAR 36 and FAR 36, but that harmonisation of these two codes with the Airworthiness Regulations of JAR 23 and FAR 23 was also desirable.

2. DISCUSSION

Records show that the original maximum take-off weight of 12500 lb (5700 Kg), common to both the American and European Airworthiness Regulations for "Small Propeller Driven Aircraft", was increased by the FAA to 19000 lb (8618 Kg) by Amendment 23-34 to FAR 23, Effective February 17, 1987. This increase in maximum take-off weight, followed considerable debate and consultation, going back over many years, between the FAA, Industry and Interested Parties on how to cover the certification of "Commuter Type Aircraft" without having to comply with the more demanding FAR Part 25, the requirements for Large Transport Aircraft. Amendment 23-34 to FAR Part 23 introduced the Commuter Category which allowed both an increase in maximum take-off from 12500 lb to 19000 lb and an increase in the maximum number of passengers permitted from 9 to 19.

This approach by the FAA to problem of Certification of Commuter Category Aircraft was initially adopted by some individual European Airworthiness Authorities, but more importantly, it was adopted by JAA in the formulation of JAR 23.

With the exception that FAR Part 23 expresses maximum take-off weight in pounds only, with no kilogram equivalent, whereas JAR list kilograms with a (correct) pound equivalent, both Regulations list the same maximum take-off weight of 19000 lb/ 8618 Kg.

Because of the considerable history of debate and consultation between Airworthiness Authorities, Industry and other interested parties on the issue of an appropriate maximum take-off weight, which resulted in the agreement to adopt 19000 lb/8618 kg as a maximum take-off weight for Airworthiness Certification, no argument or justification can be found for a different maximum weight to be applied for Noise Certification. Therefore, the Noise Regulations should be amended to reflect the Airworthiness Limit. FAR Part 36 already reflects the Airworthiness maximum take-off weight by specifying 19000 lb. A minor clerical amendment is needed to correct the Kilogram equivalent from the present 8640 to

2. cont.d

8618 and to add the kg unit identifier which is not currently shown. This is a FAA domestic issue and FAA have been made aware of the error. As JAR 36 reflects ICAO Annex 16, a change to Annex 16 is needed to allow JAR 36 to be changed. ICAO Annex 16 should be amended to change all reference to 9000 kg to 8618 kg.

To ensure that no difficulties will be caused by changing ICAO Annex 16 a search has been made of aircraft bordering the maximum weight band effected i.e. 19000 lb/8618 kg to 19842 lb/9000 kg. Using as reference documents, FAA Advisory Circular AC No. 36-1F and the British General Aviation Manufactures and Traders Association (GAMTA) General Aviation Data Base, a list has been compiled of all propeller driven aircraft with maximum take-off weights of over16000 lb (7257 kg) but no greater than 25000 lb (11340 kg). Only 9 aircraft were found in this weight bracket. Figure 1 plots each of the 9 aircraft against a vertical weight scale. As can be seen from this figure, there is a considerable gap either side of weight band in question i.e. 19000 lb (8618 kg) to 19842 lb (9000 kg). In the lighter weight group of aircraft certificated to FAR 23, the heaviest is the CASA C212C at 17000 lb. If this or any of the other aircraft listed in the under 19000 lb group are developed to weights in excess of 19000 lb they will have to meet the Airworthiness Regulations of FAR/JAR 25 instead of FAR/JAR 23. This presents formidable problems and it was the opinion of the FAR/JAR Harmonisation Working Group for Propeller Driven Small Aircraft that this sort of development was most unlikely to take place. It is not an accident that there is a gap between the top end of the FAR/JAR 23 aircraft at 17000 lb and the bottom of the FAR/JAR 25 aircraft at 21000 lb. There are good practical considerations that result from the Airworthiness Regulations the steer manufacturers into this "jump" in weight

However, in the (extremely) unlikely event that an aircraft is increased in weight to over 19000 lb and hence into the FAR/JAR 25 Airworthiness Regulations the manufacturer will have to accept that he will have to comply with the appropriate Large Aircraft Noise Regulations. The remote chance of this arising and the penalty thus incurred, is considered a penalty worth paying in exchange for the benefits of harmonisation.

Similarly it was the opinion of the Group that it is most unlikely that a FAR/JAR 25 aircraft in the heavy group would be developed down to a lower weight. In the unlikely event of this happening the manufacturer could opt for the less onerous Noise Certification procedures for small aircraft

No conflict with the large aircraft Airworthiness Regulations of either FAR 25 or JAR 25 will result in changing ICAO Annex 16 to align it with the maximum take-off weight of both FAR23 and JAR 23.

3. RECOMMENDATION

In the interests of harmonisation it is recommended that ICAO Annex 16 be amended to change all references to 9000 Kg to 8618 Kg; to be consistent with the maximum take of weight specified by the Airworthiness Regulations of JAR 23 and FAR 23.

LPDA-TPP-004
Power Adjustments
John F Bertolacci

August 8, 1995

Applicable FAR: FAR 36, Appendix G, G36.201(d)(4)

Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to-

$\text{Delta}(3) = 17 \log (P_r / P_t)$

Where P_r and P_t are the test and reference engine powers respectively.

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2(d)

Measured sound levels shall be adjusted for engine power by algebraically adding an increment equal to-

$\text{Delta}_3 = K_3 \log (P_r / P_t)$

Where P_r and P_t are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test aeroplane. In the absence of flight test data and at the discretion of the Authority a value of $K_3 = 17$ may be used.

1. Recommendation

It is recommended that FAR 36, Appendix G, G36.201(d)(4) be revised as follows:

"Measured sound levels in decibels must be corrected for engine power by algebraically adding an increment equal to-

$\text{Delta}(3) = K_3 \log (P_r / P_t)$

Where P_r and P_t are the test and reference engine powers respectively obtained from the manifold pressure/torque gauges and engine rpm. The value of K_3 shall be determined from approved data from the test Airplane. In the absence of flight test data and at the discretion of the FAA a value of $K_3 = 17$ may be used."

2. Background and Relevant Data

The only technical difference between these two regulations is the power correction constant. The FAR regulation requires the use of 17 for this constant. The FAR regulation requires the use of 17 for this constant. This value was an average value derived from FAA tests on seven aircraft (Reference 1). The power correction constant from this data base had a variation from 1.5 to 39.3, and for the same aircraft the constant varied as much as 26.7 points (12.6 to 39.3). In another FAA report (Reference 2), the power correction factor derived from tests varied from -0.7 to 10.7 at the primary microphone site.

3. Discussion

Based on the wide variation of the test derived power correction factor on the eight aircraft tested, it is recommended that the JAR wording be adopted and the power correction constant be determined from approved data from the test aircraft but a value of 17 can be used at the discretion of the certification authority. This would also be more consistent with the way the Mach Number adjustment is determined.

References

1. FAA Report EE-83-1, "Noise Levels and Data Analyses for Small Prop-Driven Aircraft", dated August 1993

2. FAA Report EE-86-1, "Acoustic Flight of the Piper Lance", dated December 1986

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

LPDA-TPP-005

Differences in the Measurement Height from Meteorological Data

R Wilson

18th August 1995

This Paper was formatted to meet the requirements for submission to CAEP3 in Montreal in December 1995.

The proposal was accepted by CAEP3.

LPDA-TPP-005

DIFFERENCES IN THE MEASUREMENT HEIGHT FOR METEOROLOGICAL DATA

(Author - R Wilson)

18th August 1995

APPLICABLE: ICAO Annex 16, Appendix 6 and JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2.

RECOMMENDATIONS FOR HARMONIZATION

ICAO Annex 16 Appendix 6, 2.2.2 should be amended to reflect the flexibility of FAR 36, Appendix G, G36.101 (b)(6) by adopting the FAR 36 wording.

ICAO Annex 16 Appendix 6, 2.2.2 (b) would then read: "... below 2°C."

ICAO Annex 16 Appendix 6, 2.2.2 (c) would then read: "... above 9 Km/h (5 kt) using a 30s average."

ICAO Annex 16 Appendix 6, 2.2.2 (d) would then read: "... points specified by the Authority; and ..."

A new ICAO Annex 16 Appendix 6, 2.2.2 (e) would add: "The meteorological measurements must be made between 1.2 m and 10 m above ground level. If the measurement site is within 1 nm of an airport meteorological station, measurements from this station may be used."

JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2 should be similarly amended.

BACKGROUND & RELEVANT DATA

As presently published, there is a difference in the permitted measurement heights for Meteorological Data as specified by FAR 36, Appendix G, G36.101 (b)(6) and ICAO Annex 16 Appendix 6, 2.2.2 (b) and (c). JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2 (b) and (c) is identical to ICAO Annex 16. The FAR allows for measurement between: "... 4 ft (1.2 m) and 33 ft (10 m) above ground level...." ICAO Annex 16 specifies "... at 1.2 m above the ground..."

LPDA-TPP-006
Microphone Height and Noise Limits
R L Howes and R Wilson
10/11/95

Applicable FAR: FAR 36, Appendix G, G36.107(a) and G36.301(b)

Applicable JAR: JAR 36, 5th Draft, Sept 1995, Section 1, Sub Part D, JAR 36.330 and Appendix 3, 4.4.1

1. Recommendation

Adopt JAR wording for both microphone position and configuration and associated noise limits.

2. Discussion

Considerations of microphone location and configuration and resulting noise limits are inter-related. This issue is not new. Much study and discussion has gone on. Technical papers summarizing analysis and test results comparing the microphone locations and configurations have been carried out and documented. See references [1]-[8].

The technical facts are that a microphone inverted over a metal plate at ground level affords a measurement not affected by variable ground reflections interacting with source radiation, which is in contrast with the 1.2m location.

A review of the two configurations will show that the effect of reflections from the metal plate is consistent and increases the measured levels by about 3 dB(A) when compared with a 1.2m configuration. Tests carried out with the 1.2m configuration show that the interaction with ground reflections is not consistent.

In the majority of cases the data acquired and analyzed in the course of establishing compliance with subject regulations can be a valuable tool for determining the physics controlling the noise radiation in specific cases. As such it is often used to determine effective changes and modifications. Using a data set from a 1.2m microphone introduces inconsistency and error which compromises this. The data obtained using the ground plane configuration provides a more consistent and reliable data base.

Social pressure for increased stringency is mounting. The need to respond to this pressure cannot be ignored. Any effective response must be based on a good understanding of the physics of noise from light propeller driven aircraft. Time, economy and available technology will no doubt dictate an experimental approach characterised by small and progressive improvements. Therefore it is more important than ever to be able to acquire consistent and reliable data without using a separate test setup. With the differences that exist today among bodies of regulations most manufacturers make two sets of measurements. Some even repeat the testing using each microphone measurement configuration. This imposes economic burdens associated with two microphone setups and/or repeatability issues if the test is conducted twice.

It is recommended that the JAR wording be adopted. This will require an adjustment to the current FAR limit to account for the reflection effect discussed. Although this may appear in some circles as decreased stringency, it is not. In the long term it will enable a quicker, more economic response to stringency issues and will assist with source noise reduction studies.

References -

1. DOT/FAA/EE-85-8, "1985 Small Propeller-Driven Aircraft Noise Test Program", preliminary report, dated October 1985.

2. CAEP/1-WP/14, Working Paper, Presented by Mr. Hierl, Fed. Rep. of Germany, Mar 19, 1986.

3. CAEP/1-WP/20, Working Paper, Presented by Mr. Cowling, UK, Apr 17, 1986.

4. CAEP/1-WP/21, Working Paper, Presented by Mr. Cowling, UK, Apr 17, 1986.

5. CAEP/1-WP/23, Working Paper, Presented by Mr. Cowling, UK, Apr 17, 1986.

6. CAEP/1-WP/40, Working Paper, Presented by Mr. Wesler, USA, May 13, 1986.

7. CAEP/1-WP/45, Working Paper, Presented by Mr. Cowling, UK, May 21, 1986.

8. CAEP/1-WP/48, Working Paper, Presented by Mr. Smith, ICCAIA, May 21, 1986.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

LPDA-TPP-007
Calibration & Tape Requirements
R G Hund
8/29/95

Applicable FAR: FAR 36, Appendix G, G36.105(f) and Appendix A, A36.3(e)

Applicable JAR: JAR 36, 5th Draft, Sept 1995, Section 1, Appendix 3, 4.4.2 and 4.4.3

1. Recommendation

Harmonization/Regulation change is not required.

2. Background & Relevant Data

The Joint Aviation Requirements, Part 36, and the Federal Aviation Requirements, Part 36, if a tape recorder is used, require the same verification of the frequency response of each electrical system and similar frequency response tests of each reel of magnetic tape.

The differences between the JAR and FAR requirements for magnetic tape testing are the minimum duration of the calibration tone and the 1/3 octave bands evaluated.

JAR - "Each reel of magnetic tape ... carry a calibration signal consisting of at least a 15 second burst"...
"the level difference in the 10 kHz 1/3 octave band filtered levels ... is not more than 0.75 dB."

FAR - "Each reel of magnetic tape ... carry a calibration signal consisting of at least a 15 second burst" ...
"the difference between each 1/3 octave band exceeds 0.75 dB."

3. Discussion

The JAR and FAR magnetic tape validation test requirements can be satisfied by conducting the tape evaluation to meet both regulations with a negligible difference in cost.

The JAR requires that the calibration signal duration is 30 seconds instead of a minimum of 15 seconds.

The FAR requires evaluation of each 1/3 octave band instead of just the 10 kHz band.

Recommendation is that no changes to the FAR or to the JAR are required for Harmonization.

LPDA-TPP-008
Power Deviations Allowed
Carlos Latoni
July 17, 1995

Applicable FAR: FAR 36, Appendix G, G36.201(c)(2)

Applicable JAR: None

1. Recommendation

Add to the JAR, Section 1, Appendix 3, 5.2.1, the use of 5% power deviation for fixed pitch propeller as stated in FAR

2. Background & Relevant Data

The power/rpm variation on a fixed pitch propeller is affected by several factors, mainly aircraft pitch attitude, temperature and humidity. The rpm, which is directly related to power, is difficult to control during the climb out. The slight change in pitch attitude will result in an increase or decrease in rpm. It is, therefore, desirable to provide a tolerance to which no data correction is required for either power or propeller tip Mach Number. The JAR does not provide a tolerance to power deviations, where the FAR does for the reasons previously mentioned.

3. Discussion

The JAR 36, Section 1, Appendix 3, should be modified to incorporate the engine power and propeller tip mach number deviation as follows:

In 5.2.1(c)

Add item (a) The propeller is fixed pitch and the test power is within 5% of the reference.

In 5.2.1(d) add the following sentence:

5.2.1(d) ..... engine rpm. For fixed pitch propellers if the power is not within 5% of reference power. .....

LPDA-TPP-009
Power Definitions
Carlos Latoni
July 18, 1995

Applicable FAR: FAR 36, Appendix G, G36.111(2)(iv)

Applicable JAR: JAR 36, Section 1, Sub-Part D, 36.340 (b)(2)(iv)

1. Recommendation

Replace JAR 36, Section 1, Sub-Part D, 36.340(b)(2)(iv) with FAR 36, Appendix G, G36.111 (2)(iv) wording for the 2nd phase (segment) of the take-off portion.

2. Background & Relevant Data

Not applicable

3. Discussion

The JAR 36, Section 1, Sub-Part D, 36.340 (b)(2)(iv) can be interpreted to allow the use of a power setting other than take-off power or maximum continuous power during the 2nd phase of the take-off. The FAR clearly states take-off or maximum continuous power, which is consistent with FAR 23. JAR 36 which reads as follows is not specific and allows the authority to allow the use of lower power settings even if the propeller is of a variable pitch type.

(iv) The maximum power and RPM that can be continuously delivered by the engine or engines in this flight condition shall be maintained throughout the second phase (unless a lower limiting power is established by the Authority).

LPDA-TPP-010
Mach Tolerance
John F Bertolacci
August 9, 1995

Applicable FAR: FAR 36, Appendix G, G36.201(c)(3).

Applicable JAR: JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2 (c)

1. Recommendation

It is recommended that FAR 36, Appendix G, G36.201(c) be revised to add a sub-section (3) as follows:

No adjustments for helical tip mach number variation need be made if the propeller helical tip mach number is:

1. At or below 0.70 and the test helical tip Mach Number is within 0.014 of the reference helical tip Mach Number.

2. Above 0.70 and at or below 0.80 the test helical tip Mach Number is within 0.007 of the reference helical tip Mach Number.

3. Above 0.80 and the test helical tip Mach Number is within 0.005 of the reference helical tip Mach Number. For mechanical tachometers, if the helical tip Mach Number is above 0.8 and the test helical tip Mach Number is within 0.008 of the reference helical tip Mach Number.

2. Background & Relevant Data

JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 5.2.2(c) allows additional latitude when correcting for helical tip Mach Number. If the test helical tip Mach Number falls within a certain tolerance of the reference helical tip Mach Number then no correction is required. No tolerance is defined under the referenced FAR.

3. Discussion

Attachment 1 contains an analysis for nine US manufactured aircraft which represent a good cross section of US propeller driven aircraft. Reference 1 contains the actual K2 values for each aircraft as well as the reference helical tip Mach Numbers. The data was analyzed assuming the M_T was equal to M_R reduced by the maximum tolerance based on the reference M_R.

The resulting corrections ranged from 0.09 to 0.70 dB(A), with an average of 0.44 dB(A) for all the samples. All the values are well within the tolerance of a Type 1 sound level meter as defined by Table 5 in Reference 2.

Reference

1. FAA Report EE-83-1, "Noise Levels and Data Analyses for Small Prop-Driven Aircraft", dated August 1983.

2. IEC Publication 651, "Sound Level Meters"

TPP 10, Attachment 1

	TECHNICAL POSITION PAPER 10 WORK SHEET					
	LA=K2*LOG(MR/MT): JAR 5.2.2(c)					
No.	Aircraft	K2 (Ref 1)	MR (Ref 1)	MT (Note 1)	LA (K2-Ref 1)	LA (K2-150)
1	C-170	70.2	0.715	0.708	0.2999	0.6409
2	PA-38	75.8	0.67	0.656	0.6952	1.3756
3	PA-28	148.2	0.772	0.772	0.5810	0.588
4	C-180	126.6	0.827	0.819	0.5345	0.6332
5	B-58P	143.6	0.841	0.833	0.5961	0.6226
6	C-414	148.9	0.824	0.816	0.6309	0.6356
7	KA-200	53.7	0.786	0.786	0.2068	0.5776
8	PA-42	76.6	0.758	0.758	0.3058	0.5988
9	C-441	21.6	0.708	0.708	0.0923	0.6409
	AVE.=	96.1333		AVERAGE=	0.4380	
NOTES:						
1. MT = MR - .014; MR< .70; JAR 5.2.2 (c)(1): A/C No.2						
MT = MR - .007; MR< .70; JAR 5.2.2 (c)(1): A/C No.1, 3, 7, 8 & 9						
MT = MR - .005; MR< .80; JAR 5.2.2 (c)(3)						
MT = MR - .008; MR< .80; JAR 5.2.2 (c)(3) with mechanical tachometers A/C No. 4, 5 & 6						
2. Ref 1 = FAA REPORT EE-83-1, "NOISE LEVELS AND DATA ANALYSES FOR						
SMALL PROP-DRIVEN AIRCRAFT", TABLES 10.1 AND 17.3						

LPDA-TPP-011
Slow "A" Weighting
R G Hund
8/31/95

Applicable FAR: FAR 36, Appendix G, G36.105(e)

Applicable JAR: JAR 36, Section 1, Appendix 3,3 Noise Unit Definitions; JAR 36, Section 1, Appendix 3, 4.3 Sensing Recorking and Reproducing Equipment.

1. Recommendation

No harmonization recommended.

2. Background & Relevant Data

Both bodies of regulation require the subject meter setting. The wording differs between FAR and JAR.

3. Discussion

Even though the wording differs between the bodies of regulation, the intrepretation is the same.

LPDA-TPP-012
Items Not Harmonized
R L Howes and R Wilson
10/11/95

Applicable FAR: See text

Applicable JAR: See text

In Document 2a, Items 1, 4, 5, 7 and 11 were not recommended for harmonization. It was concluded that harmonization was not required for the following reasons:

Item 1: Applicability

The applicability dates listed have all lapsed making this issue moot.

Items 4 and 5: Tape Recording, Calibration and Quality

See LPDA-TPP-007

Item 7: Pre/De-Emphasis Recording

No harmonization is recommended here. The standards that describe the requirements for this type of equipment are in the process of being updated to take into account the technological benifits of newer digital instruments and data processing equipment.

Item 11: Reference Noise Level

This is already harmonized. The only difference is that JAR 36 summarizes the corrections to be applied in the form of an equation and FAR 36 simply states the requirement.

General -

There are instances in which certain numerical rounding differences cause values to deviate by a small amount between the bodies of regulation. These differences are not considered significant enough to warrant the efforts required to harmonize them, eg. FAR 36, Appendix G, G36.101(b)(2) specifies the lower test temperature limit as 2.2 deg C and JAR 36, 4th Draft, Dec 1993, Section 1, Appendix 3, 2.2.2(b) calls out 2 deg C.

Appendix C: Meeting Minutes

Subject: Meeting Minutes

Date: 20 October 1994

To: ARAC Propeller HWG Membership

From: R. Howes
R. Wilson

Attachments:
1. Agenda.
2. Attendee List.
3. Summary of Action Items.
4. Document List.
5. Revised Document 2, Document 2A.

Agenda is attached. Meeting followed agenda closely. Session began with introductions as indicated.

Reviewed agenda and no changes or additions were needed.

Began discussion on terms of reference (TOR). Discussion centered on what our working group would produce. It was decided that we would probably produce two documents, one for US agencies (NPRM) and one for European Agencies (NPA). It was further decided that more than one document could be submitted to each agency if timing, priorities and issues involved would benefit.

It was pointed out that harmonization really involved two areas. First, amendments to each of the bodies of regulation could be proposed (NPRM/NPA). Second, advisory material could be reviewed for harmonization. Mr Kearsey pointed out that JAR is tied closely with ICAO, Annex 16. This body of regulation involves the consensus of many nations. Therefore changes for harmonization instigated through the NPA process that would require changes to Annex 16 could take a long time. However, harmonization that could be effected through advisory material could be expedited. This was duly noted.

Messrs Kearsey and Depitre suggested that we might modify our current terms of reference (statement of purpose and execution) to include how we intend to execute our charter. We agreed to do this. Modified TOR is attached.

Established a document tracking system to keep track of supporting documents that are handed out. Document list is attached.

The first document entered was the agenda. The next two documents were lists of differences between FAR 36, Appendix G and ICAO Annex 16, Chapter 10. Document 2 was a list generated in the JAR 36 working group and presented at the third meeting in Paris, 2 December 1993. Document 3 was a list prepared by Mr Marsan and presented for the first time at this meeting.

Review of documents 2 and 3 was undertaken item by item and actions assigned. It was decided that the items in Document 2 covered everything in Document 3. Mr Latoni pointed out that neither document addressed the power variation differences allowed for aircraft with fixed pitch propellers. This item was added and revised Document 2A is attached.

Consensus was that a harmonization position could be generated on most items. Some items will need to be simply researched and coordinated. It was decided that Technical Position Papers (TPP) would be prepared where necessary. These are apparent in list of attached action items.

Following is a list of the items from Document 2A showing actions and relevant comments.

Doc 2A Item	Comments	Action Item
1. Applicability	No harmonization recommended	
2. Weight Limit	Discussion centered around coordination of the general cert requirements of FAR 23 and JAR 23. It was agreed that the maximum weight for noise cert should reflect those in these two codes.	4
3. Mic Height	Tabled for further consideration.	
4,5 & 7. Calibration and Tape Requirements	Combined and assigned to Ron Hund	9
6. Met Data	It was agreed that the flexibility allowed in FAR 36 was desirable.	8
8. Absorption correction window	Discussion revealed that this was possibly due to rounding error in unit conversion.	3
9. Absorption correction	This item needed some research. A TPP with a recommended position will be prepared and presented at the next meeting.	2
10. Power Adjustments	This item needed some research. A TPP with a recommended position will be prepared.	6
11. Ref Noise Level	No action required.	
12. Noise Limits	Tabled for further consideration.	
13. Power Deviations allowed	This item needed some research. A TPP with a recommended position will be prepared.	7

Began work on advisory material. It was determined that both codes were supported by a body of advisory material. JAA material was mostly appended to the body of regulation as notes in selected sections and in Section 2, Advisory Material, Joint (AMJ). Very little of the material in Section 2, JAR 36 applied to light propeller driven aircraft. FAA material is being consolidated in a noise reference manual currently under preparation.

Discussions indicated a need for attention to techniques for correcting helical tip Mach No. It was decided that this would be coordinated with the preparation of subject manual. It was further decided that parts of this manual could be effectively used in support of JAR. Mr Mellers of Slingsby agreed to go through the JAR and summarize the advisory notes contained for comparison to the FAA noise manual and presented as a TPP at the next meeting.

In closing it was agreed that harmonization could be recommended and documents submitted soon for most items. Therefore it was decided to meet again in February rather than December to give adequate time for research and preparation of TPP's with the intent that harmonization documents could be submitted as early as May 1995.

Next meeting is planned for 21-22 February 1995. It will be hosted by CAA and held in Gatwick, West Sussex, United Kingdom.

Robert L Howes
US Co-Chair

R Wilson
European Co-Chair

Attachment 3: Summary of Action Items

1. Draft a proposed schedule.
   Bob Wilson

2. Document 1, Item 9. Prepare a Technical Position Paper (TPP) on the differences in absorption correction factors and reference temperatures and recommend a harmonization position.
   Rob Howes

3. Document 1, Item 8. Review absorption correction windows and recommend a harmonization position.
   Mehmet Marsan

4. Document 1, Item 2. Prepare a TPP on the differences in gross weight cutoff values and recommend a harmonization position.
   Bob Wilson

5. Interpretive Item. Prepare a TPP on how the test time allowed before gross weight adjustments become necessary is defined in both bodies of regulation.
   Ron Hund

6. Document 1, Item 10. Prepare a TPP on power correction procedures and recommend a harmonization position.
   John Bertolacci

7. Document 1, Item 13. Prepare a TPP on the 5% power window allowed for fixed pitch propeller aircraft and recommend a harmonization position.
   Carlos Latoni

8. Document 1, Item 6. Recommend a NPA to JAR that will harmonize measurement height. Handle location in interpretative material.
   Bob Wilson

9. Document 1, Items 4,5 and 7. Summarize the differences between analog tape quality requirements and calibration procedures and report to committee.
   Ron Hund

10. Interpretative Item. Prepare a TPP on helical tip Mach Number correction issues and allowed margins. Co-ordinate this effort with Mehmet Marsan's efforts. Recommend a harmonization position.
    Rob Howes & Carlos Latoni

Attachment 4: Document List

Document 1 -
Meeting Agenda

Document 2
Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for propeller driven light aeroplanes.

Document 3
Mehmet Marsan regulation comparison labeled "comp.xls".

Document 4
Handbook for Aviation Rulemaking Advisory Committee (ARAC) and Working Group Members.

Document 5
Internal Operating Procedures for Support of the Aviation Rulemaking Advisory Committee (ARAC).

Document 6
Document entitled, "Group of experts on the Abatement of Nuisances caused by Civil Air Transport".

Attachment 5

Document 2A

Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for Propeller Driven Light Aeroplanes

Item	Chapter 10/Appendix 6	Appendix G
1. Applicability	C of A application after 19th November 1988 (10.1.1). Failures can be tested to Chapter 6 until 17 November 1993(10.1.2).	Aeroplanes tested after 22nd December 1988 (Appendix G table). no provision.
2. Weight limit	up to 9,000 Kg maximum take-off weight (10.1.1).	8,640 Kg max take-off weight, (G36.301(b)).
3. Microphone height	7 mm above a ground plate (Appendix 6, 4.4.1).	4ft above ground level (G36.107(a))
4. Pseudo-random pink noise cal for recordings.	relative output of each 1/3 octave band not more than 0.2 dB (Appendix 6, 4.4.2).	not defined
5. Tape quality	Variation in 10 KHz band of 30 secs of calibration signal at beginning and end of type not greater than 0.75 dB (Appendix 6, 4.4.3).	not defined
6. Meteorological data	collected at 1.2m (Appendix 6, 2.2.2(b),(c))	collected between 1.2m and 10m (G36.101(b)(6))
7. Pre/de-emphasis recording	not defined	G36.105(d)
8. No absorption correction window	figure 6-2	lower temperature is 35.6 deg F (2.5 deg C compared with 2 deg C in Annex 16) (Fig G1)
9. Adjustments, absorption outside test window.	d(M) = 0.01 (Ht*alpha-0.2*Hr) Appendix 6, 5.2.2.(a)	not specified, G36.201(a)(4)(b) or d(M) = (alpha - 0.7)*Ht/1000
10. Power adjustments	d3=K3*log(Pr/Pt) Appendix 6, 5.2.2(d)	d3=17log(Pr/Pt) G36.201(d)(4)
11. Reference noise level	(Lamax)Ref=(Lamax)test+d(M)+d1+d2+d3	
12. Noise limits	76 dB(A) up to 600 Kg and increasing at 9.83 dB(A) per doubling of noise until the limit of 88 dB(A) is reached and is constant up to 9000 Kg.	
13. Power variance	no equivalent	36.201(c)(2) allows for 5% power variation for aircraft with fixed pitch propellers.

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

21-22 February 1995
Gatwick, UK

Subject: Meeting Minutes

Date: 22 February 1995

To: ARAC Propeller HWG Membership

From: R Howes
R Wilson

Attachments:
1. Attendee List.
2. Summary of Action Items.
3. Document List.
4. Recommended format for Technical Position Papers (TPP's).
5. TPP list.
6. Errata.
7. Schedule.

Meetings followed agenda. No agenda changes were proposed. List of attendees is attached. Willem Franken of the Netherlands Rijksluchtvaartdienst sent his regrets as he had planned to attend.

Action items 1 through 13 were completed. Drafts of TPP's were presented and discussed.

The working group has reviewed and updated the required harmonization items, prepared draft TPP's, reviewed and discussed these TPP's and recommended a harmonization position. TPP's will be finalized, put in a standard format and submitted at the conclusion of our work as supporting material. NPRM's will be drafted for changes recommended to FAR 35. JAR 36 changes will be proposed by papers submitted to CAEP/ATISG.

Draft TPP for document 2A, item 9 (absorption correction factors and reference temperatures) was discussed. JAR position was recommended. Reference LPDA-TPP-001.

Draft TPP for document 2A, item 8 (absorption correction windows) was discussed. JAR position was recommended. Reference LPDA-TPP-002.

Draft TPP for document 2A, item 2 (gross weight categories) was discussed. FAA position was recommended. Reference LPDA-TPP-003. Regulations for heavy aircraft are

affected since they quote a lower limit. It was decided that LPDA-TPP-003 will be presented this March in Seattle at the next meeting of the CAEP/ATISG.

This will be done so that this recommendation can be entered into the ICAO process as soon as possible since a JAR change has been recommended. See action items 14, 15 and 16.

The two bodies of regulation were reviewed for their treatment of gross weight adjustments during testing. They were determined to be in harmony.

Draft TPP for document 1, item 10 (power correction procedure) was presented and discussed. JAR position has been recommended. Reference LPDA-TPP-004.

Draft TPP's for document 1, item 13 (5% power window allowed in FAR 36) and the interpretive issue on helical tip mach number corrections was presented and discussed. This issue is currently under review by ICAO/CAEP working groups and others. It was decided to draft a letter summarizing the concerns of this working group and submit it CAEP/ATISG and others. The major concern is that test procedures for determining a reasonable correction factor will be imposed that will not be practical or even possible in the case of small propeller driven aircraft with fixed pitch propellers.

Document 1, item 6 (measurement height for meteorological conditions) was discussed. FAA position has been recommended. Reference LPDA-TPP-005.

Draft TPP for document 1, items 4,5 and 7 (analog tape calibration and quality) was presented and discussed. It was pointed out that new standards are under consideration for digital recording techniques. It was decided to table this issue and Co-ordinate with the heavy aircraft working group. Reference action item 20.

The FAA position on temperature inversions was clarified. No temperature inversion is allowed during testing. The JAA position was also clarified. Decision to test in the presence of temperature inversion is left to the JAA representative at the test site. These positions are not in harmony. The JAA position is preferred. Reference action item 23.

A review of JAR interpretive notes was presented and experience with US noise documents was presented and discussed. Both of these discussions focused on how various bodies of regulation are interpreted. It was pointed out that there is a need to

harmonize interpretive material. Action items 26, 27 and 28 will be presented at the next meeting.

The next meeting is scheduled for 6-7 July 1995 in Washington DC at the FAA offices in the Department of Energy. Reservation information along with meeting agenda information will follow.

Robert L. Howes, US Co-Chair

Robert Wilson, European Co-Chair

Attachment 1: List of Attendees

Rob Howes	Cessna Aircraft
Dieter Pade	AOPA, Germany
Frank Weiblen	MT-Propeller
Alain Depitre	JAA/DGAC France
Peter Kearsey	JAA/CAA UK
Mehmet Marsan	FAA USA
Rick Bowerman	Hartzell Propeller
Bob Wilson	Pilatus Britten Norman
Barry Mellers	Slingsby Aviation
Graham Forbes	GAMTA
Guy Readman	JAA/CAA UK

Attachment 2: Summary of Action Items

Action Items generated at Ottawa Meeting, 15-16 Sep 1994:

1. Draft a proposed schedule.
   Bob Wilson.
   Complete.

2. Document 2A, Item 9. Prepare a Technical Position Paper (TPP) on the differences in absorption correction factors and reference temperatures and recommend a harmonization position.
   Rob Howes.
   Complete. JAR regulation proposed for harmonization. TPP will be finalized for submittal as supporting information.

3. Document 2A, Item 8. Review absorption correction windows and recommend a harmonization position.
   Mehmet Marsan.
   Complete. JAR window proposed for harmonization. TPP will be finalized for submittal as supporting information.

4. Document 2A, Item 2. Prepare a TPP on the differences in gross weight cutoff values and recommend a harmonization position.
   Bob Wilson.
   Complete. FAA cutoff values proposed for harmonization. TPP being finalized for presentation at next ATISG meeting and submittal as supporting information.

5. Interpretive Item. Prepare a TPP on how the test time allowed before gross weight adjustments become necessary is defined in both bodied of regulation.
   Ron Hund
   Complete. Regulations determined to be in harmony. No further action.

6. Document 2A, Item 10. Prepare a TPP on power correction procedures and recommend a harmonization position.
   John Bertolacci
   Complete. JAR regulation proposed for harmonization. TPP will be finalized and submitted as supporting information.

Attachment 2: Summary of Action Items (continued)

7. Document 2A, Item 13. Prepare a TPP on the 5% power window allowed for fixed pitch propeller aircraft and recommend a harmonization position.
   Carlos Latoni

   Complete. This procedure is being revamped by ICAO through its CAEP process. It was decided to submit a letter to the CAEP process documenting the concerns that have been raised in this working group.

8. Document 2A, Item 6. Recommend a NPA to JAR that will harmonize measurement height. Handle location in interpretative material.
   Bob Wilson.
   Complete. Decision has been made to finalize a TPP and recommend the FAA position be adopted. This item not appropriate for interpretive material. See action item 19 below.

9. Document 2A, Items 4,5 and 7. Summarize the differences between analog tape quality requirements and calibration procedures and report to committee.
   Ron Hund.
   Complete. Item tabled until some coordination with heavy aircraft group can occur. See action item 20 below.

10. Interpretative Item. Prepare a TPP on helical tip mach number correction issues and allowed margins. Co-ordinate this effort with Mehmet Marsans efforts. Recommend a harmonization position.
    Rob Howes
    Carlos Latoni
    Complete. This has been combined with action item 7 and will be covered as described there.

11. Interpretative Item. Clarify FAA position on temperature inversion conditions.
    Mehmet Marsan.
    Complete. FAA position was not in harmony with JAR. See action item 23 below.

12. Interpretative Item. Review JAR notes and summarize their content for review and comparison to FAA reference document on noise measurement.
    Barry Mellers.
    Complete.

Attachment 2: Summary of Action Items (continued)

13. Interpretative Item. Summarize experience in review US noise documents and document apparent differences in interpretative materials.
    Alain Depitre.
    Complete. See action items 26 and 27 below.

Action Items generated from Gatwick Meeting, 21-22 Feb 1995:

14. Supply gross weight information for industry aircraft to Bob Wilson. Mehmet Marsan.

15. Formalize TPP on certification weight limits so that it can be submitted to ATISG in Seattle March. Bob Wilson

16. Co-ordinate the attendance of a HWG member at the ATISG working group meeting in Seattle in Mar 95 to present our weight category harmonization recommendations. Rob Howes.

17. Co-ordinate our weight category harmonization position with the heavy aircraft working group, Ken Orth. Rob Howes.

18. Draft a letter to the ATISG outlining some of the concerns about handling aircraft with fixed pitch propellers when determining helical tip Mach Number correction factors. Rob Howes.

19. Prepare a TPP on measurement height requirements for determining meteorological conditions and have it ready for submittal to the ATISG in March 95. Bob Wilson.

20. Co-ordinate with heavy aircraft working group re tape calibration and quality issues and report back. Rob Howes.

Attachment 2: Summary of Action Items (continued)

21. Rework TPP on absorption correction procedures and prepare document for submittal as supporting information for the HWG final recommendation. Rob Howes.

22. Prepare a TPP on measurement microphone configuration and recommend a harmonization position. Rob Howes and Bob Wilson.

23. Petition the FAA to adopt the JAA wording regarding "anomalous" meteorological conditions. Mehmet Marsan.

25. Prepare a TPP on sound level meter measurement settings (fast vs slow) and recommend a harmonization position. Barry Mellers.

26. Co-ordinate the efforts of selected committee members to assemble descriptions of their measurement setups and test data acquisition practices and submit these to Bob Wilson and Barry Mellers for consideration in work under item 27 below. Rick Bowerman.

27. Prepare a TPP outlining interpretive material for ICAO Annex 16 and JAR 36, light propeller driven aircraft. This paper will consider data already compiled in draft form and under consideration by the FAA so that interpretative material will be harmonized. Draft will be reviewed for concurrence by JAA and FAA representatives. Bob Wilson and Barry Mellers.

Attachment 4: Recommended Format for Technical Position Papers.

Use the heading shown above without the date and location and include the following:

TPP No.

Title of working paper

Author

Date

Applicable FAR:

Applicable JAR:

1.0 Recommendation

2.0 Background and Relevant Data

3.0 Discussion

TPP No: Page ij of kk

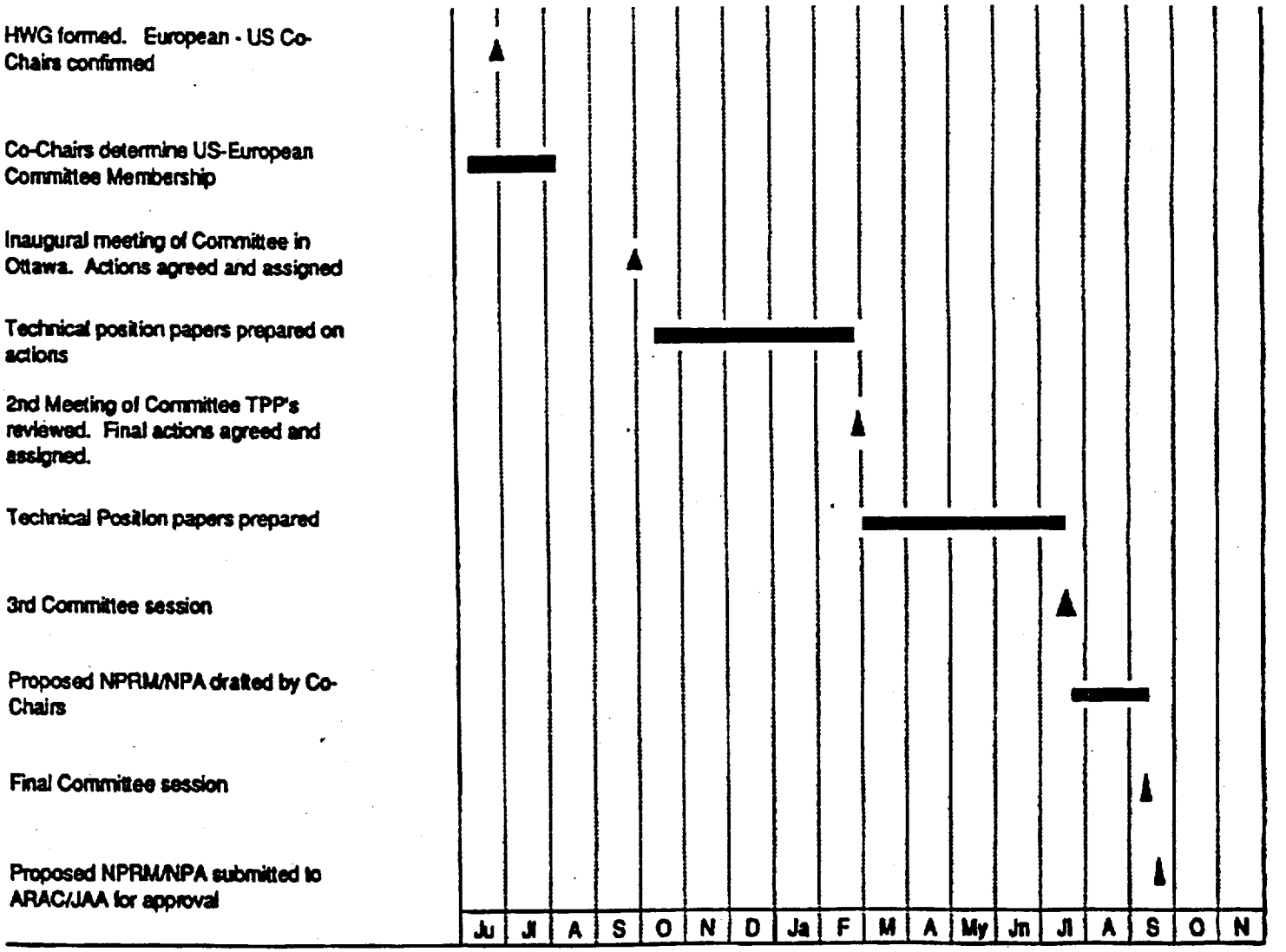
Attachment 5: List of Technical Position Papers

LPDA-TPP-001	Absorption Correction Factors and Reference Temperatures.
LPDA-TPP-002	Temperature/Humidity Test Windows.
LPDA-TPP-003	Gross Weight Categories.
LPDA-TPP-004	Power Correction Procedures.
LPDA-TPP-005	Measurement Heights for Determining Meteorological Conditions.
LPDA-TPP-006	Measurement Microphone Location and Orientation.

Attachment 6: Errata

1. Meeting minutes data 20 October 1994, Summary of action items, items 2 through 9 referred to Document 1. These items should have referred to document 2A.

Attachment 7: Schedule



Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Subject: Meeting Minutes Date: 7 July 1995

To: ARAC Propeller HWG Membership From: R. Howes

R. Wilson

Attachments:
1. Attendee List.
2. Summary of Action Items.
3. Recommended format for Technical Position Papers (TPP's).
4. TPP list.
5. Document List.
6. Schedule.

Third meeting of Propeller Driven Small Aircraft HWG was held in Wichita, KS 6-7 July 1995. List of attendees is attached. Apologies for absence are acknowledged from Barry Mellers, Dieter Pade, Graham Forbes, Frank Weiblen and Willem Franken.

A review of action items was conducted. New list was compiled and is attached.

Mehmet Marsan submitted a new schedule showing activites required to submit our recommendations to the FAA. Schedule is attached.

Requirements for drafting regulation changes were discussed. It was decided that the Co-Chairs will be briefed by the FAA legal staff in Washington. Briefing is tentatively scheduled for Tuesday, 11 July 1995.

LPDA-TPP-003, Gross Weight Categories, was submitted to ATISG and then to Working Group 1. It was agreed that this paper will be discussed at CAEP 3 in Montreal in December 1995.

Much discussion was devoted to the subject of making measurements for the purpose of calculating a correction factor for helical tip mach number. Action Item 27 was the result of this discussion.

Committee has decided to generate a final report. This document will contain all of the Technical Position Papers on the attached list. These papers will recommend harmonization positions where required and will present the technical justification. TPPs will be submitted in the attached format.

Interpretative material and selected certification experience will be compiled in an appendix to the committee's final report. This appendix will be submitted separately to the ATISG working group under an industry letter for consideration in their technical manuals. Appendix will also be submitted to FAA for consideration of Appendix G Handbook.

Agreement was reached to adopt the ICAO microphone position and to adjust levels to compensate for the physics of the new location. However, it was decided that a final review of industry data should be conducted to insure that there is no impact from the recommended harmonization.

Robert L. Howes
US Co-Chair

Robert Wilson
European Co-Chair

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Attachment 1: List of Attendees

Rob Howes	Cessna Aircraft
Alain Depitre	JAA/DGAC France
Peter Kearsey	JAA/CAA UK
Mehmet Marsan	FAA USA
Rick Bowerman	Hartzell Propeller
Bob Wilson	Pilatus Britten Norman
Carlos Latoni	Piper Aircraft
John Bertolacci	Fairchild Aircraft Inc
Ron Hund	Ratheon Aircraft Corp

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Attachment 2: Summary of Action Items

Action Items generated at Ottawa Meeting, 15-16 Sep 1994:

1. Draft a proposed schedule.
   Bob Wilson.
   Complete.

2. Document 2A, Item 9. Prepare a Technical Position Paper (TPP) on the differences in absorption correction factors and reference temperatures and recommend a harmonization position.
   Rob Howes.
   Complete. JAR regulation proposed for harmonization. TPP will be finalized for submittal as supporting information.

3. Document 2A, Item 8. Review absorption correction windows and recommend a harmonization position.
   Mehmet Marsan.
   Complete. JAR window proposed for harmonization. TPP will be finalized for submittal as supporting information.

4. Document 2A, Item 2. Prepare a TPP on the differences in gross weight cutoff values and recommend a harmonization position.
   Bob Wilson.
   Complete. FAA cutoff values proposed for harmonization. TPP being finalized for presentation at next ATISG meeting and submittal as supporting information.

5. Interpretive Item. Prepare a TPP on how the test time allowed before gross weight adjustments become necessary is defined in both bodied of regulation.
   Ron Hund
   Complete. Regulations determined to be in harmony. No further action.

Attachment 2: Summary of Action Items (continued)

6. Document 2A, Item 10. Prepare a TPP on power correction procedures and recommend a harmonization position.
   John Bertolacci
   Complete. JAR regulation proposed for harmonization. TPP will be finalized and submitted as supporting information.

7. Document 2A, Item 13. Prepare a TPP on the 5% power window allowed for fixed pitch propeller aircraft and recommend a harmonization position.
   Carlos Latoni

   Complete. This procedure is being revamped by ICAO through its CAEP process. It was decided to submit a letter to the CAEP process documenting the concerns that have been raised in this working group.

8. Document 2A, Item 6. Recommend a NPA to JAR that will harmonize measurement height. Handle location in interpretative material.
   Bob Wilson.
   Complete. Decision has been made to finalize a TPP and recommend the FAA position be adopted. This item not appropriate for interpretive material. See action item 19 below.

9. Document 2A, Items 4,5 and 7. Summarize the differences between analog tape quality requirements and calibration procedures and report to committee.
   Ron Hund.
   Complete. Item tabled until some coordination with heavy aircraft group can occur. See action item 20 below.

Attachment 2: Summary of Action Items (continued)

10. Interpretative Item. Prepare a TPP on helical tip mach number correction issues and allowed margins. Co-ordinate this effort with Mehmet Marsan's efforts. Recommend a harmonization position.
    Rob Howes
    Carlos Latoni
    Complete. This has been combined with action item 7 and will be covered as described there.

11. Interpretative Item. Clarify FAA position on temperature inversion conditions.
    Mehmet Marsan.
    Complete. FAA position was not in harmony with JAR. See action item 23 below.

12. Interpretative Item. Review JAR notes and summarize their content for review and comparison to FAA reference document on noise measurement.
    Barry Mellers.
    Complete.

13. Interpretative Item. Summarize experience in review US noise documents and document apparent differences in interpretative materials.
    Alain Depitre.
    Complete. See action items 26 and 27 below.

Action Items generated from Gatwick Meeting, 21-22 Feb 1995:

14. Supply gross weight information for industry aircraft to Bob Wilson. Mehmet Marsan. Complete

15. Formalize TPP on certification weight limits so that it can be submitted to ATISG in Seattle March. Bob Wilson. Complete

16. Co-ordinate the attendance of a HWG member at the ATISG working group meeting in Seattle in Mar 95 to present our weight category harmonization recommendations. Rob Howes. Complete

Attachment 2: Summary of Action Items (continued)

17. Co-ordinate our weight category harmonization position with the heavy aircraft working group, Ken Orth. Rob Howes. Complete

18. Draft a letter to the ATISG outlining some of the concerns about handling aircraft with fixed pitch propellers when determining helical tip mach number correction factors. Rob Howes. Superceded by AI 27.

19. Prepare a TPP on measurement height requirements for determining meteorological conditions and have it ready for submittal to the ATISG in March 95. Bob Wilson. Complete

20. Co-ordinate with heavy aircraft working group re tape calibration and quality issues and report back. Rob Howes. Complete

21. Rework TPP on absorption correction procedures and prepare document for submittal as supporting information for the HWG final recommendation. Rob Howes. Complete

22. Prepare a TPP on measurement microphone configuration and recommend a harmonization position. Rob Howes and Bob Wilson. Superceded by AI 37.

23. Petition the FAA to adopt the JAA wording regarding "anomalous" meteorological conditions. Mehmet Marsan. Complete.

24. Prepare a TPP on sound level meter measurement settings (fast vs slow) and recommend a harmonization position. Superceded by AI 35. Barry Mellers.

25. Co-ordinate the efforts of selected committee members to assemble descriptions of their measurement setups and test data acquisition practices and submit these to Bob Wilson and Barry Mellers for consideration in work under item 27 below. Rick Bowerman. Superceded by AI 41.

Attachment 2: Summary of Action Items (continued)

26. Prepare a TPP outlining interpretive material for ICAO Annex 16 and JAR 36, light propeller driven aircraft. This paper will consider data already compiled in draft form and under consideration by the FAA so that interpretative material will be harmonized. Draft will be reviewed for concurrence by JAA and FAA representatives. Bob Wilson and Barry Mellers. Superceded by AI 41.

Action Items generated from Wichita meeting, 6-7 July 1995:

27. Measure and prepare an experimental data set showing the variation of helical tip Mach Number vs dB(A). Co-ordinate with selected industry experts and attempt to define an analytical version of the measured data. Have data ready for presentation at the Frankfurt meeting in Sept 95. Supercedes AI No. 18 above. Rob Howes.

28. Prepare LPDA-TPP-010 on the tolerance allowed by JAA in helical tip mach no. Make a harmonization recommendation. John Bertolacci.

29. Prepare a cover letter for LPDA-TPP-005 and submit it to Mike Smith of Rolls Royce as an industry position letter for consideration at the upcoming meeting of CAEP 3. Bob Wilson.

30. Prepare LPDA-TPP-007, Tape Calibration Requirements. Ron Hund.

31. Modify LDPA-TPP-001, Absorption Correction Factors and Reference Temperatures, and clarify units. Prepare TPP for submittal. Rob Howes.

32. Prepare a section for the committee's interpretive document outlining an interpretation of the requirements regarding temperature inversions from JAA. Bob Wilson.

33. Check with FAA in Washington to see if it makes any sense to exclude aerobatic aircraft from Appendix G requirements and possibly pick them up somewhere else. Mehmet Marsan.

Attachment 2: Summary of Action Items (continued)

34. Prepare a section for the committee's interpretive document outlining how altitude measurement and flight path verification are done using a camera. Rob Howes.

35. Prepare LPDA-TPP-011, SLM settings, to outline new wording for the JAR's that will specifically call out the SLM settings. Ron Hund.

36. Prepare LPDA-TPP-009, Power Definitions, so that power settings that are admissible are clearly defined in both sets of regulations. Carlos Latoni.

37. Prepare LPDA-TPP-006, Measurement Microphone Location and Orientation. Compile some industry data as part of the work. This supercedes AI No 22 above. Rob Howes and Bob Wilson.

38. Make parts of the European database on Chapter 10 test results available to the committee. Database will be on 3 1/2" floppy in Microsoft EXCEL format. Rob Howes and Bob Wilson will co-ordinate committee distribution. Alain Depitre.

39. Add some clarification to the Appendix G Handbook, 14 CFR Part 36, to spell out where reference conditions are measured, eg on the ground or at altitude. Make the revised wording available to Bob Wilson. Make an electronic copy of handbook available. Mehmet Marsan.

40. Contact GAMA and discuss whether any involvement in the International Co-ordinating Council of Aerospace Industries Association (ICCAIA) to promote the interests of general aviation would be appropriate. Rob Howes and Bob Wilson.

41. Co-ordinate committee inputs and compile an appendix for advisory material and submit to ATISG as background information and publication as ICAO advisory material. Supercedes AI No 26 above. Alain Depitre and Rick Bowerman.

42. Conduct a final review and compare JAR 36 and FAR 36 to insure that all harmonization issues have been addressed. Rob Howes and Bob Wilson.

Attachment 2: Summary of Action Items (continued)

43. Submit a report to the JAR 36 Study Group on committee progress. Bob Wilson.

44. All TPP's to be put in final committee format and submitted to committee chairs by 11 August 1995. All

Attachment 3: Recommended format for Technical Position Papers.

Use the heading shown above without the date and location and include the following:

TPP No.

Title of working paper

Author

Date

Applicable FAR:

Applicable JAR:

1.0 Recommendation

2.0 Background and Relevant Data

3.0 Discussion

TPP No: Page ij of kk

Attachment 4: List of Technical Position Papers

LPDA-TPP-001	Absorption Correction Factors and Reference Temperatures.
LPDA-TPP-002	Temperature/Humidity Test Windows.
LPDA-TPP-003	Gross Weight Categories.
LPDA-TPP-004	Power Correction Procedures.
LPDA-TPP-005	Measurement Heights for Determining Meteorological Conditions.
LPDA-TPP-006	Measurement Microphone Location and Orientation.
LPDA-TPP-007	Tape Calibration
LPDA-TPP-008	Power Deviations
LPDA-TPP-009	Power Definitions
LPDA-TPP-010	Helical Tip Mach No. Tolerances
LPDA-TPP-011	SLM Setup
LPDA-TPP-012	Items not Harmonized

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

6-7 July 1995
Wichita, Kansas

Attachment 5: Document List

Document 1
Meeting Agenda

Document 2A
Comparison of ICAO Annex 16 Chapter 10 and FAR Part 36 Appendix G for propeller driven light aeroplane.

Document 3
Mehmet Marsan regulation comparison labeled "comp.xls".

Document 4
Handbook for Aviation Rulemaking Advisory Committee (ARAC) and Working Group Members.

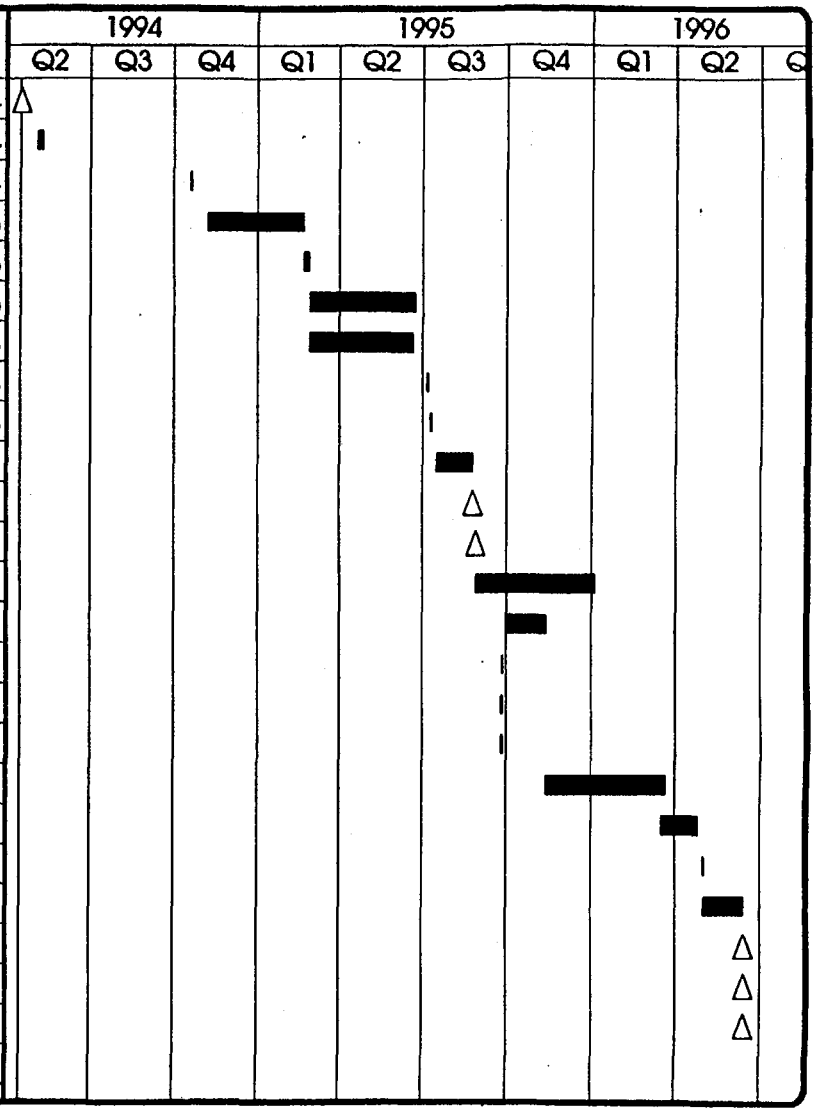
Document 5
Internal Operating Procedures for Support of the Aviation Rulemaking Advisory Committee (ARAC).

Document 6
Document entitled, "Group of experts on the Abatement of Nuisances caused by Civil Air Transport".

Document 7
List of technical position papers.

FAR/JAR Harmonization (Noise) under ARA

Row #	Task Name	Start	End
1	ARAC Establishes WG	Apr/16/94	Apr/16/94
2	Fed Reg Notice	May/04/94	May/10/94
3	1st Meeting (Ottawa)	Oct/20/94	Oct/21/94
4	Prepare Tech Positions	Nov/08/94	Feb/21/95
5	2d Meeting (Gatwick)	Feb/21/95	Feb/27/95
6	Update Position Papers	Feb/28/95	Jun/23/95
7	Comapre App G handbook	Feb/28/95	Jun/21/95
8	3d Meeting (Wichita)	Jul/06/95	Jul/07/95
9	ARAC Orientation by APM	Jul/10/95	Jul/10/95
10	Prepare Concept Paper	Jul/17/95	Aug/25/95
11	Submit Concept Paper to ARAC	Aug/25/95	Aug/25/95
12	Submit Concept Paper to GAMA	Aug/28/95	Aug/28/95
13	Draft NPRM	Aug/28/95	Jan/05/96
14	Drafting Support by APM	Oct/02/95	Nov/13/95
15	4th Meeting (Frankfurt)	Sep/26/95	Sep/27/95
16	AGC Guidance by AGC	Sep/25/95	Sep/27/95
17	APO Guidance by AEE	Sep/25/95	Sep/27/95
18	Reg Eval by APO	Nov/13/95	Mar/22/96
19	Legal Review by AGC	Mar/18/96	Apr/26/96
20	5th Meeting	May/01/96	May/02/96
21	Prepare Final NPRM	May/02/96	Jun/13/96
22	Submit to ARAC	Jun/13/96	Jun/13/96
23	Submit to JAR Study Group	Jun/13/96	Jun/13/96
24	Submit to GAMA	Jun/13/96	Jun/13/96



Printed: Oct/12/95

Milestone △ Summary ▬
Fixed Delay - - - -

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Subject: Meeting Minutes From: R Wilson (European Co-Chair)

Circulation: All LPDA HWG Members

Meeting Host & Location: AOPA-Germany, Egelsbach, nr Frankfurt, Germany

Attachments:
1. Attendee List
2. Agenda
3. Draft 3 of Concept Paper
4. Action List

Agenda Item 1 - Apologies for Absence & General

The fourth meeting of the LPDA HWG was held at the AOPA-Germany Offices on the outskirts of Frankfurt, on 14th and 15th November 1995. The list of attendees is attached. Apologies for absence were received from: Graham Forbes, Rob Howes, Mehmet Marsan, Carlos Latoni, John Bertholacci and Ron Hund. As the FAA representative was unable to attend, this fourth meeting of the Working Group did not count as an ARAC recognised meeting.

Rick Bowerman deputised for Rob Howes as the US Co-Chair.

The draft agenda circulated before the meeting was agreed with one addition: to review the actions of the Wichita meeting. This was added as Agenda Item 5A.

Agenda Item 2 - Review & Approve Minutes of Wichita Meeting

The minutes of the Wichita meeting were accepted as an accurate record of the meeting. Several typographical errors were identified. The Chairman noted these and corrections will be made in the redraft of the Concept Paper.

Agenda Item 3 - Confirm the Position of Industry Committee Members

At the time of the meeting, it had been confirmed that two of the three European Industry Committee members: Bob Wilson for Pilatus Britten-Norman and Barry Mellers for Slingsby Aviation Ltd had authority to speak for their Companies. Copies of the letters of authorisation will be sent to the US Co-Chair. A summary of the authority of each industry committee member may be included in a future issue of the Concept Paper.

Agenda Item 3 - cont.d

The situation with regard to the two General Aviation representing organisations, GAMTA and AOPA is to be confirmed following consultation with a representation of their membership and management.

Note: Clarification of whether the Working Group's Industry Members had authority to speak for their respective companies, or whether they only spoke as individuals, was asked for by David Hilton, ARAC Joint Chair, when Rob Howes and Bob Wilson presented the Concept Paper, 1st Draft, to him and Bill Schultz of GAMA in October 1995.

Obviously, if the Committee's Industry representatives have the authority to speak for their Companies it increases the authority of the Committee.

Agenda Item 4 - Review & Agree Concept Paper

All attendees had been circulated Draft 1 of the Concept Paper, dated October 1995, prior to the meeting.

A preliminary copy of the 2nd Draft was circulated at the meeting. This replaces Section 1 through 4 and Appendix A. The other Appendices are not effected. A copy of the revised pages is shown as Attachment 3.

The revised Concept Paper was reviewed page by page. With the exception of minor changes to wording to add clarification (Paras 2.2 and 4.3 only) and correction of typographical errors, this revised Concept Paper was agreed unanimously except for changes arising from the review of the Technical Position Papers. Also it was recommended that a Glossary of abbreviations be added as Appendix F and that a list of the references in ICAO Annex 16 equating to those JAR 36 requirements identified for harmonization be added.

Bob Wilson volunteered to take on these two actions. **Action: Bob Wilson**

The review of the TPP's listed in Appendix B of the Concept Paper, is minuted below. Appendices C, D and E were reviewed page by page. There were no substantive changes arising, only typographical errors. Bob Wilson marked up a "Master Copy" with all errors identified.

Agenda Item 5 - Review & Confirm Committee Support and Agreement for all TPP's prepared to date

All TPP's were reviewed in detail. Only those changes of substance are listed below. Numerous typographical errors and minor changes were identified. Bob Wilson marked up a Master Copy of Appendix B of the Concept Paper with all the changes.

It was recommended that a standard format of reference to FAR's and JAR's be adopted, following the example:

"Applicable FAR: FAR 36, Appendix G, G36.201(d)(1)"

"Applicable JAR: JAR 36, 5th Draft, September 1995, Section 1, Appendix 3, 5.2.2

Use of the words "para or section" before the final reference should be dropped throughout.

eg. ..... Appendix F, G36.201(d)(1) not .....Appendix F, para G36.201(d)(1)

It was also recommended that wherever "Mach Number" is referred to it should be spelt with a capital M and N.

TPP-003: Add note to cover sheet that approval was given to the recommendation of this TPP at the ICAO Working Group, Bonn Meeting in June 1995 and will be proposed for adoption into Annex 16 at CAEP3 in Montreal in December 1995.

TPP-006: Paragraph one of 2.0 says "See Reference 1 and 2". Only Reference 1 is listed. Peter Kearsey offered to look up the document reference of the ICAO work to be listed as Reference 2.

Several changes to the text to clarify and/or strengthen the case were proposed. These are listed on the "Master Copy" marked up at the meeting.

TPP-008: A proposal was made that this TPP be put on hold pending the outcome of CAEP3 when proposals which could impact on this subject will be tabled by ATISG. An appropriate note to this effect should be added to Section 2 of the Concept Paper. Action on Bob Wilson to discuss with Rob Howes and agree wording.

Agenda Item 5 - (cont.d)

TPP-009: This paper was accepted in principle but it was felt that the "Discussion" Section, Section 3 needed expanding to clarify the power setting concerns.

The point was made that if this paper could be amended quickly, it was still possible to get in on the Agenda for CAEP3. The best route would be via ICCAIA. Bob Wilson to discuss with Rob Howes the possibility of getting the paper amended quickly and whether to ask Mike Smith of ICCAIA to raise it at CAEP3. (An alternative ICCAIA approach could be via GAMA).

TPP-010: It was proposed that under "Applicable JAR", only the JAR 36 reference is needed and that the actual requirement should not be listed. This would be consistent with all other TPP's.

Under recommendation the words of JAR 36 should be used except for the differences between imperial and metric units.

The paper is "light" on data. Rob Howes has an Action (Action 27 from the Wichita Meeting) to provide more experimental data. This should be added to TPP-010.

TPP-011: It was proposed that this TPP be cancelled. It was pointed out at the meeting that there is a definition of "slow" and "fast" in JAR 36. Although the wording is different to that of FAR 36 it implies the same definition and therefore no harmonization is required. Bob Wilson to discuss with Rob Howes.

The JAR 36 (and equivalent ICAO Annex 16) references are:

JAR 36, Section 1, Appendix 3, 3 Noise Unit Definitions

JAR 36, Section 1, Appendix 3, 4.3 Sensing, Recording & Reproducing Equipment

ICAO Annex 16, Appendix 6, 3 and 4.3

A repércussion of cancelling TPP-011 is that Item 16 of Annex A and Table 1 of the Concept Paper also need deleting and the reference to TPP-011 and Item 16 deleted in Para 2.13.

Agenda Item 5 - (cont.d)

TPP-012: This needs amending to remove reference to Item 7 which TPP-012 says is covered by TPP-007. This is not the case, TPP-007 only addresses Items 4 and 5.

It is proposed that Item 7 be addressed by a new TPP, TPP-013. (It is believed harmonization is not required but this must be investigated to confirm. If harmonization is judged not to be necessary, then the words added as Section 2.4A will need to be added to the Concept Paper. (A proper section number with a re-shuffling of section numbers will be required.) **Action: Bob Wilson & Rob Howes**

On the assumption that the above changes (and the typographical corrections and minor errors marked up on the Master Copy at the meeting) are embodied, all committee members present approved the TPP's.

Agenda Item 5A - Review Actions of Wichita Meeting

The Action Items of the Wichita Meeting were reviewed. A few minor typographical errors were identified. Bob Wilson "marked up" a master copy for correction and inclusion in the next issue of the Concept Paper. **Action: Bob Wilson/Rob Howes**

A summary of the status of the Action Items is:

Action Item	Responsible	Status
27	Rob Howes	In work
28	John Bertholacci	TPP-010 issued. Action complete
29	Bob Wilson	Action complete
30	Ron Hund	TPP-007 issued. Action complete
31	Rob Howes	TPP-001 issued. Action complete
32	Bob Wilson	In work
33	Mehmet Marsan	Outstanding
34	Rob Howes	In work
35	Ron Hund	TPP-011 - under review
36	Carlos Latoni	TPP-009 issued but needs revising
37	Rob Howes & Bob Wilson	TPP-006 issued. Action complete
38	Alain Depitre	Information issued. Action complete
39	Mehmet Marsan	In work. (Electronic copy of hand-book made available to Bob Wilson)

Agenda Item 5A - cont.d

Action Item	Responsible	Status
40	Rob Howes & Bob Wilson	Action on-going. (Initiated)
41	Alain Depitre & Rick Bowerman	Ongoing
42	Rob Howes & Bob Wilson	Action complete
43	Bob Wilson	Action complete
44	All	Action complete

Agenda Item 6 - Review Status of Harmonization Issues Requiring Change to ICAO Annex 16

Following a review of harmonization issues requiring a change to ICAO Annex 16, a summary situation was agreed. With reference to Table 1 of the Concept Paper.

Item 2, Weight Limit and Item 6, Meteorological Data: Recommendation for change, to align with FAR 36 will be submitted to ICAO CAEP3 at Montreal in December 1995.

Item 13 Power Variance; The JAA representatives suggested that this item be put on hold pending the outcome of CAEP3 when proposals will be tabled by the ATISG which may have an effect on this issue. Action on P Kearsey to advise on the situation post CAEP3.

Item 14, Power Definition: It was felt by the meeting that the "Discussion" section of TPP-009 needed expanding to clarify the reasoning. If this could be completed before the start of CAEP3 it should be possible to get a recommendation for change tabled at CAEP3, by ICCAIA.

Action: R Wilson to discuss updating TPP-009 with R Howes and C Latoni

Item 16, Sound Level Meter Settings. See comments on TPP-011 above. Not a harmonization issue.

Agenda Item 7 - Working Sessions to Agree Format & Content of Advisory Material

R Wilson to draw up proposal based on the FAA Handbook.

Agenda Item 8 - Agree programme to review appropriate parts of FAR 36 & JAR 36 to cross check all harmonization issues have been identified

It was the opinion of the meeting that all harmonization issues within the scope of the Group, had been covered. The outstanding item is the advisory material. (Action down to Bob Wilson) A concern raised, was how to ensure any future changes to either code, could be controlled to ensure on going harmonization. It was agreed that R Wilson and R Howes would discuss this with ARAC and the JAR 36 Study Group.

Agenda Item 9 - Review and agree committees work task timetable/programme & Agenda Item 10 - Agree next (final?) meeting

It was agreed that the majority of the Group's work was complete. Outstanding tasks fell mainly to the Co-Chairs.

A Revised completion timetable needed to be agreed in discussion with ARAC/FAA.
Action: Bob Wilson/Rob Howes

A provisional date for a final meeting (if required) was set for 19-20 March 1996

Attachment 1: List of Attendees

Bob Wilson	Pilatus Britten-Norman Ltd
Peter Kearsey	CAA/JAA UK
Barry Mellers	Slingsby Aviation Ltd
Rick Bowerman	Hartzell Propeller
Frank Weiblen	MT Propeller
Dieter Pade	AOPA-Germany
Willem Franken	RLD The Netherlands/JAA
Alain Depitre	DGAC/JAA

FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes

14 - 15 November 1995
Frankfurt, Germany

Attachment 2: Agenda for Light Propeller-Driven Aircraft, Harmonization Working Group Meeting, 14th & 15th November 1995, Frankfurt, Germany

1. Apologies for absence

2. Review and approve minutes of Wichita meeting

3. Confirm position of Industry Committee Members: Do they have authority to speak for their respective companies or only as individuals (written confirmation on Company headed note paper is required.)

* 4. Review and agree the concept paper prepared by Rob Howes and Bob Wilson, and presented to ARAC in October 1995.

5. Review and confirm committee support and agreement for all TPP's prepared to date.

5A Review actions of Wichita Meeting.

6. Review status of harmonization issues requiring a change to ICAO Annex 16.

7. Working sessions to agree format and content of advisory material.

8. Agree programme to review appropriate parts of FAR 36 and JAR 36 to cross check all harmonization issues have been identified.

9. Review and agree committees work task timetable/programme.

10. Agree next (final?) meeting.

* Note: Prior to the meeting a copy of the concept paper was circulated to all committee members. This included a complete set of TPP's (and previous meeting minutes).

Attachment 3: Draft 3 of Concept Paper

Draft 3 of Concept Paper is still in work and will be despatched in due course

Attachment 4: Action List

A summary of the outstanding actions from the Wichita Meeting and the new actions arising from the Frankfurt meeting is listed below. Those Action Items from the Wichita Meeting that have been completed are not listed hence the gaps in the numbering.

Outstanding Actions from the Wichita Meeting

27 Measure and prepare an experimental data set showing the variation of helical tip mach number vs dB(A). Co-ordinate with selected industry experts and attempt to define an analytical version of the measured data. Have data ready for presentation at the Frankfurt Meeting in September '95. Supersedes AI No. 18. **Action - Rob Howes**

32 Prepare a section for the committee's interpretative document outlining an interpretation of the requirements regarding temperature inversions from JAA. **Action - Bob Wilson**

33 Check with FAA in Washington to se if it makes any sense to exclude aerobatic aircraft from Appendix G requirements and possibly pick them up somewhere else. **Action - Mehmet Marsan**

34 Prepare a section for the committee's interpretative document outlining how altitude measurement and flight path verification are done using a camera. **Action - Rob Howes**

35 Prepare LDPA-TPP-011, SLM settings, to outline new wording for the JAR's that will specifically call out the SLM settings. **Action - Ron Hund**

36 Prepare LDPA-TPP-009, Power Definitions, so that power settings that are admissible are clearly defined in both sets of regulations. **Action - Carlos Latoni**

39 Add some clarification to the Appendix G Handbook, 14 CFR Part 36, to spell out where reference conditions are measured, eg. On the ground or at altitude. Make the revised wording available to Bob Wilson. Make an electronic copy of handbook available. **Action - Mehmet Marsan**

40 Contact GAMA and discuss whether any involvement in the International Co-ordinating Council of Aerospace Industries Association (ICCAIA) to promote the interests of General Aviation would be appropriate. **Action - Bob Wilson/Rob Howes**

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Appendix D: Membership List

Aviation Rulemaking Advisory Committee
FAR/JAR Harmonization Working Group
Propeller Driven Small Airplanes
Concept Paper

Working Group Membership List

John Bertolacci
Fairchild Aircraft
USA
210-824-9421 x7328(7318) Tel
210-824-3869 Fax

Richard Bowerman
Hartzell Propeller
USA
513-778-4359 Tel
513-778-4365 Fax

Graham Forbes, GAMTA
United Kingdom
44 0844 238020 Tel
44 0844 238087 Fax

Rob Howes, US co-Chair
Cessna Aircraft
USA
316-941-7332 Tel
316-941-7258 Fax

Ron Hund
Beech Aircraft
USA
316-676-6943 Tel
316-676-8381 Fax

Peter Kearsey (JAA Representative)
CAA
Gatwick, UK
44 1293 573094 Tel
44 1293 573977 Fax

Alain Depitre (JAA Representative)
DGAC
Paris, France
33 1 40 43 55 94 Tel
33 1 40 43 58 02 Fax

Carlos Latoni
Piper Aircraft
USA
407-567-4361 x2448 Tel
407-562-0299 Fax

Barry Mellers
Slingsby Aviation Ltd
United Kingdom
44 0751 432474 Tel
44 0751 431173 Fax

Dieter Pade, AOPA
Germany
49 6103 42081 Tel
49 6103 42083 Fax

Frank Weiblen
MT Propeller
Germany
49 94 29 8433 Tel
49 94 29 8432 Fax

Bob Wilson, European Co-Chair
Pilatus Britten-Norman
United Kingdom
44 983 872511 Tel
44 983 873246 Fax

Mehmet Marsan (FAA Representative)
Office of Environment and Energy
Research and Engineering Branch
Washington, DC
202-267-7703 Tel
202-267-5594 Fax

Appendix E: Co-ordination Documents

FAX

To: Mr P R Kearsey - Guest

Company/Organisation: Marriott Hotel

Location: Long Beach

FAX NUMBER: 0101 310 425 2744 **Date:** 10.3.95

From: R Wilson **Page:** 1 of 5

PILATUS
BRITTEN-NORMAN
AIRCRAFT MANUFACTURERS
Bembridge, Isle of Wight
England PO35 5PR
Tel: 01983-872511
Telex: 86277/86866
Fax: 01983-873246

FAR/JAR Harmonization Working Group
Propeller-Driven Small Airplanes

Dear Peter

Please find attached the paper on Harmonization of Maximum Weight which you kindly agreed to present at the ATISG. If you have any queries or want any changes give me a call either at home or in the office.

In the event that you don't have my home number it is: 983 613145

Regards

Bob.

R Wilson
Technical Director

Appendix F: Glossary of Abbreviations & Acronyms

AC	Advisory Circular
ACJ	Advisory Circular Joint
AD	Airworthiness Directive
AECMA	Association Europeene des Constructeurs de Material Aerospatial
AI	Action Item
AMJ	Advisory Material Joint
ANCAT	Abatement of Nuisances caused by Civil Air Transport
AOPA	Aircraft Owners & Pilots Association
ARAC	Aviation Rulemaking Advisory Committee
ARP	Aerospace Recommended Practice
ATISG	Aircraft Technical Information Sub Group
CAA	Civil Aviation Authority
CAEP	Committee on Aviation Environmental Protection
CFR	Code of Federal Regulation (US)
DGAC	Direction Generale de L'Aviation Civile
FAA	Federal Aviation Administration (US Airworthiness Body)
FAR	Federal Aviation Requirements (now CFR)
GA	General Aviation
GAMA	General Aviation Manufacturers Association (US)
GAMTA	General Aviation Manufacturers & Traders Association (UK)
HWG	Harmonization Working Group
ICAO	International Civil Aviation Organisation

ICCAIA	International Co-ordinating Council of Aerospace Industries Association
IEC	International Electrotechnical Commission
JAA	Joint Aviation Authority (European Airworthiness Authority comprising 23 member states)
JAR	Joint Aviation Requirements. (Each part of the JAR's has a numeric suffix identical to that used for FAR's)
LPDA	Light Propeller Driven Aircraft
NPA	Notice of Proposed Amendment
NPRM	Notice of Proposed Rulemaking
RLD	Rijksluchtvaartdienst
SAE	Society of Automotive Engineers
SLM	Sound Level Meter
STNA	Service Technique de la Navigation Aerienne
TOR	Terms of Reference
TPP	Technical Position Paper